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ICONES

PLANTARUM INDIÆ ORIENTALIS:

OR

FIGURES OF INDIAN PLANTS.

BY

ROBERT WIGHT, M.D, F.L.S, &c.

MEMBER OF THE IMP. ACAD. NATURÆ CURIOSORUM OF THE ROYAL RATISBON BOTANICAL SOCIETY, &c.&c.&c.

SURGEON OF THE MADRAS ESTABLISHMENT.

Vol. VI.

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PREFACE.

WHILE the last sheets of this work are passing through the press, I avail myself of the leisure now at my disposal to say a few words regarding it. From its commencement in 1838 to the present time it has had to contend with considerable disadvantages, and been for the most part conducted under circumstances unfavourable to the research necessary towards ensuring correct execution. The press, both Printing and Lithographic, had at the outset to be in a great measure formed for it. The former was conducted by persons very indifferently conversant with their Art, from whom I could derive little or no assistance in the mechanical department, and who were so overloaded with newspaper business that they had little time to devote to work of this kind. Latterly a great change for the better has been effected as shown by the improved style in which it is now turned out. As regards Lithography, it was comparatively untried and much had to be learned, but happily, as the work advanced, it too improved, and has now attained such perfection as leaves little to be desired, and, considering the disadvantages resulting from the unfavourable climate which has to be contended with in India, it is perhaps scarcely susceptible of material improvement. But whether or not I am correct in this conjecture, it is certain that the later volumes are much better executed than the earlier ones. The material, too, and the getting up, owing to the unequal and uncertain supplies of the Madras stationery market, were for some time deficient in uniformity.

As regards my share of the business I have, from the outset, had to work alone and at the same time to conduct the duties of a public office. These were often extremely onerous, and not seldom forced me to pass portions more rapidly through my hands than I considered quite consistent with that accuracy of execution and detail which ought to characterize works of this kind. Add to these, the very heavy drawback of being, for the last 12 years, stationed upwards of 300 miles from the Press, and, I trust, an adequate excuse will be found for some at least of the typographical and other errors with which, I grieve to have to acknowledge, the book abounds.

In regard to errors of nomenclature, which are wholly my own, I can only say that I have been most anxious to guard against them, and have spared no pains, that I could bestow, to avoid their occurrence. These, I trust, will therefore be found fewer and for the most part, to the full as venial as the others. To have avoided them altogether was next to impossible in my situation. Such errors appertain to nearly all botanical works of this class, even when conducted under circumstances the most favourable towards insuring accuracy, such as botanical occupations and free intercourse with Botanists, ready access to large herbaria, unrestricted use of well-stocked libraries, &c. None of these has it been my good fortune to possess. If such then are found in works emanating

from the most celebrated Emporia of science in Europe, it would be great presumption in me even to hope that I could avoid them, while working alone with a limited herbarium, and an indifferently stocked library. I have, however, made it my endeavour to compensate for these disadvantages by care, in turning to the best account the sources of information within my reach, and I hope that blemishes of the kind referred to, may not in this work be found greatly to exceed those of other similar publications.

Love of novelty and the ambition of acquiring celebrity by the publication of numerous new genera and species have never influenced me in the selection of my subjects; though doubtless, when such crossed my path, I have gladly given them a place, not so much for the honor they conferred on the discoverer, as for the sake of enriching the flora of which they formed a part. Long before I ever dream't of becoming an author, I often felt the want of the aid towards the determination of an unknown plant which a figure supplies, and for which verbal description, however carefully drawn up, can never altogether compensate. My main object in commencing this work was to supply that desideratum, by the publication of figures of the plants described in my Prodromus of the Peninsular Flora. And while acting up to that intention the most common plants were as well, or even better, suited to fulfil my object as the most rare and beautiful, and, perhaps, it would now have been more useful to the Indian Botanist had I throughout adhered more strictly to my original plan.

Be that as it may, as the work advanced, and more especially after my official duties became such as to compel me from want of leisure to discontinue the systematic exposition of the natural orders in my Illustrations, it occurred to me that the Icones would be improved by imparting to them something more of a systematic character; that is, to the extent of illustrating in a continuous series of plates, whole orders; a feature in which the latter volumes differ from all similar works. By following this course, a series of more or less perfect monographs, at least of the genera, of many large orders have been produced.

Through the adoption of this plan, I have, I think, been enabled to accomplish, more perfectly than I otherwise could have done, my wish to produce a work better adapted to the wants of Indian Botanists, for whom it is principally intended, than had the more usual plan been adopted. And being well acquainted with the disadvantages under which they labour, I have, from time to time, as opportunity offered, endeavoured to lessen these by introducing explanations of elementary principles which would have been unnecessary, or indeed quite out of place, if addressed to highly accomplished European students. Fearing that the latter may sometimes be of opinion that my remarks on these occasions, however incidentally introduced, might as well have been withheld as being unnecessary and common place, I think it desirable to offer this explanation in the belief that most of those for whom the work is more especially intended, will coincide with me as to their propriety, and in the hope that others, who have no ground for complaint on the score of extra cost, will not consider their introduction objectionable.

In the early volumes I looked more to species than genera, which indeed are often the more difficult of the two to determine, but subsequently I thought it advisable to increase the number of genera in proportion to the species, as being better adapted, when grouped in orders, to convey correct and enlarged ideas of the principles of the natural system of arrangement.

This consideration, combined with the interruption of the Illustrations, led to this, if I may so call it, monographic plan, to carry out which I generally took up whole orders, and studied them until I had familiarized myself with the distinguishing features and discriminating characters of their genera. Having done so, I then selected for representation those I considered the most interesting or best adapted to convey a knowledge of the peculiarities of the family to which they belonged, as

well as of the sections, under which they had been grouped by Botanists who had particularly studied and sub-divided the order. Proceeding on this plan I have been led to the construction of more new genera than I might perhaps have deemed prudent, had I not thus in the first instance made myself well acquainted with the labours of my predecessors, and I have certainly been prevented falling into many errors, by being thereby enabled to refer transition forms to already defined genera which I at first thought entitled to form the types of new ones. Having been thus careful, I trust those genera I have ventured to form, will generally be found to rest on a firm basis.

On the subject of nomenclature I have expressed my views so fully under *Gloriosa*, that little now remains for me to add, and even that little, would have been withheld but for a notice I accidentally stumbled upon, while turning over the pages of Dr. Walpers' Annals where, in vol. 2, page 759, I find the following note, "*Mephitidia bracteata*, Wight in McClelland's Calcutta Journal of Natural History, vi. 501 (cum omnibus sequentibus speciebus sub Lasiantho!!)" To this change of name I offer no objection, nor would I have noticed it except for the derisive addition of a double point of admiration. But as it now stands I do most decidedly object, not being informed on what grounds Dr. Walpers assumes the right or deems himself justified, in taking such liberties with my opinions. My reasons for preferring Jack's prior name are fully and fairly stated in the article quoted: they may be right or they may be wrong, but be that as it may, they are the result of careful consideration, and, moreover, further consideration still inclines me to adhere to them. What may be my qualifications for arriving at a correct judgment on any such disputed point I know not, but I hope they will not be found inferior to those of the learned compiler of that very useful, I had almost said indispensable work, for such in truth it is to the Colonial Botanist. Had he merely differed in opinion, simply retaining DeCandolle's *later* for Jack's *earlier* name, I should not have noticed the change. It is not to that I object; he has a right to hold his opinions, as much as I have, but his sneering addition I consider most improper.

Having said so much on the general execution of this work, not attempting to conceal its many defects, I may now be permitted briefly to advert to another subject: the support, namely, it has received, as indicated by the pecuniary returns. This has not on the whole been very encouraging.

On this matter I believe I am correct in stating that, exclusive of the liberal Government subscription for fifty copies, the sales have never, from the outset, quite covered the cost of the paper, on which the work is printed, and that the Government subscription has not quite covered the cost of printing and lithography. Such being the case it must have been, to me, a losing concern from the commencement, and as I have had to bear the whole charge, must, but for the Government subscription, have ceased with the completion of the first volume. Such being the case it is to be hoped the votaries of botanical science who have occasion to consult the work will not fail to acknowledge their obligations to those munificent patrons of Natural Science, the Honorable East India Company, for whatever advantage they may derive from it, as without their aid I should never have had occasion to write this preface to the 6th volume. For my own part, the satisfaction enjoyed, while contemplating its progress and witnessing the benefits it was in course of conferring, by at the same time diffusing a taste for Botanical Science and fixing the fluctuating nomenclature of many species of Indian plants, has always been deemed sufficient compensation for both the labour and cost.

The Indian Flora can now, I believe, boast of being more fully illustrated than that of any other country under British sway, Great Britain alone excepted. We have now Roxburgh's Coromandel Plants, Wallich's Plantæ Asiaticæ Rariores, and Tentamen's Flora Nepalensis; Royle's Illustrations, my own Illustrations, and this work, furnishing together representations of upwards of 3000 species, exclusive of those published in detached periodicals and Hooker's Icones, which last

includes many Indian plants. To these may be added Blume's Rumphia (a work I have not been so fortunate as to have seen), and Horsfield's Java Plants. As valuable books of reference, though now rather out of date, we have Rheede's Hortus Malabaricus, Rumphius' Herbar. Amboynense, and the Floras of the two Burmanns. But so far is the field from being exhausted that, I may say for myself, had circumstances permitted, my materials are still so ample, that I could easily have continued this work through 1500 or 2000 additional plates, the subjects for the most part appertaining to the Peninsular flora. It is to be hoped, therefore, that some new aspirant to botanical fame and honors will be induced to resume the work thus prematurely dropped, now that such an efficient press exists for carrying it on.

With these brief prefatory notes I consign these volumes to the indulgent consideration of the public, cherishing the hope that they may not often disappoint the hopes of those who have occasion to consult them, and that they may prove the means of encouraging some of the many admirers of the beauties and perfections of all Nature's works, who had previously been discouraged by the difficulties which beset their path, so long as they had written characters only to guide them to a knowledge of the principles and objects of their study and admiration, to devote a portion of their leisure to the cultivation of Indian Botany.

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N. B.—Some of the above dates (viz. vols. II. and III.), I regret to say, can only be considered approximations; the successive parts, very unfortunately, not having been dated as they appeared.

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——— hispida ... No. 51
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——— Johnsoniana ... No. 49
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——— Mysorensis ... No. 5
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Pouzolzia ovalifolia ... No. 4
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——— pauciflora ... No. 55
——— pentandra ... No. 16
——— pilosa ... ... No. 47
——— procumbens ... No. 35
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——— ternata ... No. 11
——— tetrapetra ... No. 48
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——— tuberosa ... No. 44
——— vesicaria... ... No. 45
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——— pentandra ... ... No. 16
——— *suffruticosa* ... No. 43
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Epicarpurus orientalis ... 1961
——— spinosus ... 1962
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——— *Indica* 1989
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Trophis aspera 1961
——— *spinosa* 1962
Urostigma religiosum ... 1967
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Callitriche Wightiana ... 1947

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——— muricatum 1948-1-2

Mo. Bot. Garden
1904.

Ceratophyllum tuberculatum 1948-3
———— *verticillatum* 1948

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Antidesma acuminata ... 1991
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——— peepuloides 1927
——— Roxburghii ... 1928
——— sarmentosa 1929
——— sphærostachya ... 1931
——— sylvatica 1930
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Muldera trichostachya ... 1944
——— Wightiana ... 1943
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——— Dindigulensis ... 1921
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——— reflexa 1923
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—— tetrosperma ... 1954

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Gnetum funiculare 1955
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Dioscorea aculeata 2060
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——— Neilgherrensis ... 2006
——— Zedoaria 2005
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Globba *bulbifera* 2001
——— *Careyana* 2002
——— marantinoides ... 2001
——— ophioglossa ... 2002
——— *orixensis* 2002
Hedychium cernuum ... 2011
——— coronarium ... 2010
——— flavescens ... 2008-9
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——— venustum ... 2012
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——— lutea 2013
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——— virgata ... 2015
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Phalangium attenuatum ... 2037
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——— *hispida* 2079
——— latifolia 2072
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——— *cristata* ... 2082-89
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——— cristata 2082
——— decumbens 2088
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——— Lawiana 3068
——— longifolia ... 2084
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Dichospermum juncoides ... 2078
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——— *paniculata* ... 2080
——— *papilionacea* ... 2086
——— *pilosa* ... 2083

EXPLANATION OF PLATES.

VOL. VI.

1776-*bis.* NOTHOSÆRVA BRACHIATA (R. W. *Pseudanthus*, R. W. non Lieber.) This plate was accidentally omitted in its proper place. Since the publication of that Part (vol., v. Part 2d), I have learned that the name *Pseudanthus* is preoccupied, I therefore request that the name NOTHOSÆRVA may be substituted (*nothos*, spurious), in allusion to its resemblance to a true Ærva.

PIPERACEÆ.

This order in 1830, and for some years subsequent, was limited to 2 genera, *Peperomia* and *Piper*. Since then it has been carefully revised by Professor Miquel of Amsterdam, who in 1843, published his elaborate monograph of the order; in which he raised the number of genera to 20, and the species to about 600. Since the publication of that work he has made some further additions to the number of species, which may now be estimated at about 700. Of these 20 genera, illustrations, more or less perfect, of six will be found in the following 25 plates. The number of species might have been increased had I felt sure that I had so far mastered the specific distinctions as to avoid errors of nomenclature. Of this, however, I did not feel sure and have therefore, with one or two exceptions, limited my illustrations to species named by the accomplished author himself, and shall therefore exceedingly regret, should I afterwards find that in these exceptions I have fallen into errors.

Professor Miquel divides the order into two groups *Peperomieæ* and *Pipereæ*. Of 4 genera referred to the first division, Peperomia is the only one yet found in India. Of the Pipereæ, 7 of their 16 genera have Asiatic representatives. Of these 7, five are here illustrated. Of these, Muldera has only recently become known as an Indian genus, the original species being from Java. Rhincholepis and Zippelia are from the same country, but as they also may yet be found in India, I introduce their character into the following synopsis.

Section I. PEPEREÆ SPURIÆ, catkins aggregated on an axillary branch, ... POTHOMORPHE.
Section II. PIPEREÆ VERÆ, stipules opposite the leaves and petiols, usually deciduous, catkins opposite the leaves, solitary, ...
A Dioicous— ... ...
a Berries sessile, ...
1 Bracts pedicelled, peltate, 4-angled, styles none or rarely short, ... CHAVICA.
2 Bracts pedicelled, peltate with a long acumen, style long, ... RHYCHOLEPIS.
3 Flowers from a fleshy cup opening transversely, ... MULDERA.
b Berry contracted at the base into a pedicel, ... CUBEBA.
B Dioicous and hermaphrodite, bracts oblong, sessile, decurrent, ... PIPER.
C Hermaphrodite, flowers pedicelled, berry hispid, leaves multiple-nerved, ... ZIPPELEA.
This synopsis is an extract, slightly abridged, from Miquel's table.

1921. PEPEROMIA DINDIGULENSIS (Miquel), erect, branches opposite, succulent, puberulous or rarely glabrous; leaves shortly petioled, opposite (lower ones sometimes alternate and the terminal ones ternate); elliptic, obovate, or the larger ones rhombio-obovate, acute at the base, rounded, obtuse or shortly acuminate at the apex; 5-nerved, sparingly puberulous or sometimes glabrous: catkins terminal, short peduncled, filiform, erect; flowers somewhat remote, stigma puberulous: berries globose.

In moist soil in woods often found forming dense tufts on old mossy branches of trees. In some point the specimen represented does not quite agree with the character, but as corresponding ones were named by the author, I have no doubt this is only a more luxuriant form than that from which the character was taken. I have gathered it on the Pulney Mountains, Anamallay Hills, and Neilgherries.

1922-1. PEPEROMIA HEYNEANA (Miq.), erect, decumbent and rooting below, succulent, stem pilose or glabrous: leaves opposite, the upper ones in whorls of three or four, lanceolato-elliptic, obtuse or emarginate at the apex, acute or cuniate at the base, glabrous, brown spotted, sometimes slightly ciliate at the apex, one-nerved with smaller vein-ribs (venuloso-costulatis), or somewhat 3-nerved from the 2 costulæ rising at the base: catkins (aments) axillary and terminal, peduncled, filiform, erect: flowers somewhat remote, ovary ovate, bearing the stigma on the apex.

This like the former is a native of woods, growing on branches of trees or moist rocks. Also in open ground on rocks moistened by adjoining springs.

1922. PEPEROMIA PORTULACOIDES (Dietr. Miq.), succulent, glabrous, sparingly branched, creeping, deeply rooting, leafless below: leaves opposite, upper ones ternate, short petioled, succulent, glanduloso-punctuate, obovate, oblong, or sub-spathulate, obsoletely three- rarely 5-nerved: catkins axillary and terminal, solitary, longish peduncled, shorter than the peduncles, cylindrical, obtuse.

Common in alpine stations, growing in thick tufts on moist rocks or branches of trees. This species is described from Mauritius specimens, but mine were named by Professor Miquel, and answer to the character.

1923-1. PEPEROMIA REFLEXA (Dietr. and Miq.), succulent, coriaceous, rooting at the base, ascending, erect, di- or trichotomously branched, slightly puberulous or glabrous: leaves ternate or quaternate, (rare-

A

ly six at the forks) petioled, succulent, pellucid punctuate, rhombio-elliptic, obtuse or roundish, rarely retuse, contracting below into a short petiol, minutely puberulous, obsoletely 3-nerved below, speckled with depressed brown points; petiols united into a ring at the base: peduncles terminal, nearly as long as the catkins: catkins cylindrical, deeply pitted, rough.

A very common plant on the Neilgherries on branches of trees and seems pretty generally diffused in alpine ranges.

1923–2. PEPEROMIA COURTALLENSIS (Miq.), erect, succulent, glabrous, oppositely and alternately branched: leaves moderately petioled, opposite, or the upper ones verticelled, and usually larger; all varying in form and size, elliptic-oblong, or obovate, acute or attenuated at the base, rounded or alternately obtuse and emarginate at the apex; and there the younger ones ciliolate, equal or unequal-sided, pellucid punctuate, pale beneath, obsoletely one- or 3-nerved: catkins axillary or terminal; solitary or aggregated, erect, straightish; longish peduncled, rather densely flowered: berries somewhat immersed, obliquely ovate. Miq. in Hook. Bot. Jour., vol. 5, p. 549.

Courtallum, forming patches on branches of trees or on moist rocks: flowering August and September. I think I have also met with this species on the Neilgherries.

1924. PEPEROMIA WIGHTIANA (Miq.), herbaceous, succulent, erect, rooting at the base, pubescent: leaves alternate, or the upper ones opposite, petioled, the lower ones smaller, roundish or obovate, the rest elliptic or obovato-elliptic obtuse, acute at the base, glabrous; the younger ones somewhat ciliate at the apex, obsoletely 3-nerved; pellucid pointed, pale beneath: catkins longish peduncled, axillary, solitary, or the terminal ones aggregated, filiform, erect, remotely flowered: berries ovate, sub-oblique.

Malabar, in woods.

1925. POTHOMORPHE SUBPELTATA (Miq.), leaves membranaceous, pellucido-punctuate, sub-glabrous on the nerves and veins, beneath, towards the margin, puberulous between the veins, roundish reniform, cordate, acute, 11–13-nerved; the middle nerve trifid above the base: petiols for ¼ or ½ their length winged: wing evanescent: peduncles paired, unequal, 2- or several-spiked: bracts triangular, ciliate: seed black, ariolate, obovate, 3-sided.

A widely dispersed species inhabiting, in India, dense humid subalpine forests. I first found it at Courtallum, but since then have met with it in many other localities. It occurs on the eastern slopes of the Neilgherries, in moist ground, at an elevation of about 5000 feet.

1926. CHAVICA BETLE (Miq.), shrubby, scandent, rooting, branches striated: leaves membranaceous, or the adult ones coriaceous, pellucido-punctuate; shining above, glabrous on both sides; the inferior ones ovate, broadly cordate, acutely acuminate, equal-sided; the upper ones unequal sided, slightly unequally cordate, or rounded at the base, shortly acuminate or acute, septuple or quintuple-nerved: catkins peduncled; male ones long slender, patulous or deflexed; female deflexed, shorter, long peduncled: stigmas 5 or 6.

A universally cultivated plant and doubtless presenting numerous variations. The figure, which is one of Roxburgh's, differs in some points from the above character, and seems defective in its representation of the nerves which, however, I did not feel myself at liberty to alter, when sending the drawing to the Lithographer, as it bears Roxburgh's name as its authority, and I believe correctly represents the specimen from which it was taken.

1927. CHAVICA PEEPULOIDES (Miq.), branches petiols and peduncles, delicately puberulous: leaves membranaceous, pellucido-punctuate, glabrous: inferior ones ovate, equal-sided, rounded at the base, acuminate at the apex, septuple or seven-nerved; the upper ones oblong lanceolate or lanceolate, unequal-sided, slightly unequal at the base, acute or acuminate at the apex; quintuple-nerved: male catkins short-peduncled, straight or curved, much shorter than the leaves: bracts shortly pedicelled, peltate, orbicular: diandrous.

The character of this species is taken from a male plant, the drawing apparently from a female. It is a native of Silhet.

1928. CHAVICA ROXBURGHII (Miq.), stem somewhat shrubby, the sterile ones decumbent, the floriferous ones ascending, dichotomously branched, at first slightly downy, afterwards glabrous, inferior leaves long petioled, ovate, roundish, broadly cordate; acute or obtuse; seven-nerved; upper ones short petioled; top ones sessile, embracing the stems, oblong, unequally cordate, 5-nerved, all thick membranaceous, finely pellucid punctuate: petiols and nerves beneath, especially near the base, finely downy, afterwards glabrous: male catkins filiform, cylindrical, with the peduncle as long as the leaves; female ones thicker, less than half that length, about the length of the peduncle: stigmas 3–4, lanceolate.

This plant is extensively cultivated for its fruit, which is the "long pepper" of the shops. I have never met with it except in gardens, and then only as single plants. It is readily propagated by cuttings. The stems are annual, but the roots live several years, and when cultivated, usually yield three or four crops, after which they seem to become exhausted and require to be renewed by fresh planting.

1929. CHAVICA SARMENTOSA (Miq.), stem somewhat shrubby, sterile ones decumbent, rooting, floriferous ones erect, dichotomously branched, below glabrous, ramuli finely downy: lower leaves long petioled, roundish cordate or broadly ovato-cordate, shortly and obtusely acuminate, seven-nerved or decuple-nerved; upper ones short petioled or sub-sessile, ovate oblong, unequal-sided, unequally cordate or rounded at the base, acuminate, quintuple-nerved, all thick membranaceous, thickly pellucid pointed; petiols and nerves beneath downy, glabrous above: female catkins short, thick, cylindrical, as long as the peduncle: stigmas 4, lanceolate.

Native of the Eastern Archipelago whence it was introduced into the Calcutta Bot. Garden. Miquel seems to think this very nearly allied to the former, notwithstanding the figures of the two plants seem so very distinct. The fruit, like that of the preceding, is gathered and sold under the same name.

1930. CHAVICA SYLVATICA (Miq.), stem fruticose, scandent, glabrous: leaves all petioled, equally cor-

date, obtuse; base of the lobes broad orbicular, 5–7-nerved, glabrous: male catkins shortly peduncled, slender; female, short cylindrical: stamens 4.

Native of the North Eastern Provinces of Bengal. This plate is taken, like the preceding, from Roxburgh's drawing, but the name was accidentally omitted when sending it to the Lithographer.

1931. CHAVICA SPHÆROSTACHYA (Miq.), glabrous, leaves somewhat coriaceous, scarcely pellucid dotted, elliptic, unequal-sided, acute or cuniate at the base, acuminate; acumen blunt, sometimes mucronate; septuple-nerved: male catkins filiform; female, globose: bracts pedicelled, orbiculate: stigmas thin, short, recurved, connate at the base.

Eastern Islands, Nepaul, and common on the Neilgherries, where the specimens represented were obtained. It seems to be in flower or fruit at all seasons, is an extensive climber and covers the adjoining trees with a dense mass of vegetation.

1932. CUBEBA WALLICHII (Miq.), ramuli and the petiols of the young leaves, slightly downy, soon glabrous: leaves epunctulate, oblong, slightly unequal-sided, acute; deeply cordate, equal at the base; lobes rounded, nine to 13-plenerved, the three middle nerves remote from the base: berry-bearing catkins spreading, thick: the berries globose, a little produced at the apex by the remains of the stigma; shorter than the, somewhat thickened upwards, pedicel.

The following description of the specimen figured is from the same pen, and will account for its publication. I now regret not having copied Miquel's figures of the fructification into my plate, which would have made it much more complete.

"Cubeba, male specimen.—Leaves coriaceous ovate or elliptic acute, acuminate, 5–7-plenerved, three middle ones distinct from the base: catkins long filiform, flowers arranged in rings or fascicles: bracts coriaceous, obtuse, adnate at the base, concave, glabrous: stamens near a fasciculus of short hairs.

"Malabar.

"This specimen probably appertains to *C. Wallichii* of which I have as yet only seen the female, which differs in having the leaves cordate at the base: since however in this genus the leaves of both sexes often differ in form and magnitude, I may be deceived in this opinion."

It is with a view to making known the aspect of a plant, referable to a genus almost unknown in Continental India, that this imperfect figure has been introduced, in the hope that it may lead to the discovery of the fructiferous plant which should be distinguishable by having the berries not sessile or immersed in the spike, but borne on a distinct pedicel.

1933. PIPER ATTENUATUM (Hamilt.), scandent, rooting and giving off suckers, young shoots glabrous: leaves membranaceous obsoletely pellucido-punctuate; glabrous above, the petiols veins and nerves beneath roughish; the lower ones long petioled, cordate, ovate acuminate, 9-nerved; upper ones broadly ovate, truncated at the base, 7- or septuple-nerved; female catkins slender filiform, short peduncled; peduncle much shorter than the leaves; bracts adnate oblong: ovary elliptic, stigmas 4, roundish, deflexed.

Neilgherries, Eastern slopes. There is a discrepancy in the specimen represented and Miquel's description and figure of this species. The female catkin in his specimen, which is younger than mine, is about the length of the male one of my plant, or less than half the length of that of my specimen. As, however, my plant corresponds in other respects, I believe it is the same species. He had not seen male catkins and only very young female ones, and I know that in my plant they lengthen as the seed advance towards maturity.

1934. PIPER NIGRUM (Linn.), stem shrubby, climbing, rooting, round; leaves coriaceous, glabrous, pale glaucous beneath; adult ones revolute on the margins; the lower ones, roundish ovate, about equal-sided, slightly cordate or truncated at the base, septuple or noveno-nerved, namely the three middle ones each separating above the base and extending to the point; upper ones ovato-elliptic, or elliptic, usually unequal-sided, acutely acuminate, 7–5-nerved: catkins hermaphrodite or female, filiform, pendulous, shortly peduncled, shorter than the leaves: bracts linear oblong, yellow on the margin: rachis between the bracts rough: stamens two, thick, stigmas 3–4, rarely 5, thick, lanceolate: berries globose, red when ripe; floriferous calycule in the hermaphrodite 4-lobed.

Malabar. The figures are taken from specimens named by Dr. Miquel, but little dependence can be placed on the forms presented by specimens taken from cultivated plants of species that have been so long in cultivation as this one has. My impression, and I think it is also becoming Miquel's, is that *Piper trioicum* is the original type of *P. nigrum*, and that the latter should merge in the former.

1935–6. PIPER TRIOICUM (Roxb.), stem shrubby, sarmentose (throwing out runners) and creeping: leaves coriaceous, dark green above, light glaucous below; somewhat obliquely elliptic (the lower ones sub-cordate) acuminate, rounded or subacute at the base; the upper ones lanceolate oblong, 5–7-tuple-nerved: catkins trioicous; males filiform, females more rigid and shorter: bracts 3 series; of the hermaphrodites 4 series; the younger ones delicately ciliate, some glabrous; floriferous pit rough: ovary sub-globose, 3–4 stigmas: floriferous calycule of the hermaphrodite catkins 2-lobed.

Circars.

The accompanying plates are taken from Roxburgh's drawings and must therefore represent the true plant. Subsequent to Miquel's writing the above characters he had an opportunity of examining specimens from the South of India, and seems now to think that this species is scarcely distinct from *P. nigrum*, but consigns their examination and final determination to the careful consideration of Indian Botanists. My own impression is that the species are too much wire drawn, but of course in this I am likely enough to be in error, as I have, as yet, had neither leisure nor materials necessary to admit of my undertaking its minute examination, without which it would be premature to express a decided opinion.

1937. PIPER SYLVESTRE (Lamarck), stem shrubby, scandent, rooting: leaves membranaceous pellucido-punctuate, glabrous, green above, glaucous beneath, ovate, acuminate, oblique at the base, or in the lower ones somewhat cordate and equal, 7-nerved, the three middle ones extending to the apex: male catkins

peduncled, filiform, pendulous; bracts linear oblong: female about the length of the leaves; bracts oblong roughish beneath: stigmas 4, reflexed, deciduous.

Courtallum. In dense woods climbing on trunks of trees like Ivy.

1938. Piper nepalense (Mig.), younger leaves membranaceous, the adult ones membranaceo-coriaceous, glabrous on both sides, pellucido-punctuate; the lower ones obliquely ovate, or elliptico-ovate, nearly equal and rounded at the base, acuminate, and like those of the branches 7-tuple-nerved; those of the male plant narrower; female catkins erect, afterwards spreading (patulous) about the length of the leaves: bracts oblong, beneath and the rachis roughish: ovary acuminate: stigmas 3–4, lanceolate, deflexed, pubescent: berries ovate acute.

Courtallum, in dense forests climbing on trees. There are some discrepancies here between the character and figure, but not of essential importance.

1939. Piper Wightii (Miq., erroneously *P. Wightiana* on the plate), leaves coriaceous, membranaceous, finely pellucido-punctuate, glabrous, smooth above beneath, on the younger ones, sparingly hairy, ovate or elliptico-ovate, shortly acuminate, slightly unequal, rounded at the base, 7-nerved, (or the 3 middle ones united at the base) somewhat septuple-nerved, female catkins afterwards elongating equaling or exceeding the leaves, spreading; peduncles longer than the petiols: bracts oblong, linear, somewhat membranaceous: stigmas 3 or 4.

Pulney Mountains above Cunnawaddy, Courtallum, Bababuden hills, Mysore? I am not quite certain in regard to the last station, the specimens being male only. My others are female, but they seem the same species. I am indebted to the kindness of Dr. H. Cleghorn for them. Dr. Miquel compares this with *P. attenuatum*, *Nepalense*, and *sylvestre*, with all of which it more or less corresponds, but he thinks readily distinguished by its rigid coriaceous leaves, a mark which the figure cannot show.

1940. Piper arborescens? (Miq.), stem shrubby, scandent, the younger leaves membranaceous, the adult ones thick, coriaceous, shining above, glaucescent beneath, puberulous on the nerves, elliptic or ovate elliptic, obliquely shortly acuminate, unequal at the base 5- or somewhat 7-tuple-nerved: peduncles about the length of the petiols: male catkins short, somewhat curved, bracts orbicular, diandrous: females filiform, pendulous, at length very long, bracts linear oblong, sessile; stigmas 3–4, berries oblong.

Neilgherries. Fruit yellowish, passing into red when ripe.

Much as the specimens selected for representation differ in some points from the character, especially in regard to the length of the male catkins, I can hardly hesitate in considering this the species I have named, for many of my specimens, taken from the same plant, perfectly correspond with that part of the character. The point on which my doubts rest, and an account of which I have added a mark of doubt to the specific name, is the discrepancy in the form of the female bracts. This is a fine species, climbing on trees and forming large masses of pendulous herbage round their trunks and lower branches. I got it in a fine state of fructification in the months of April and May.

1941. Piper argyrophyllum (Miq.), glabrous: the upper leaves membranaceous, thickly white spotted beneath, light opaque green above, obliquely elliptico-lanceolate, taperingly acuminate, nearly equal-sided, acute or cuniately tapering at the base, the lower septuple- the upper ones quintuple-nerved, the lateral nerves not extending to the apex: female catkins peduncled: peduncles about the length or sometimes exceeding the petiols: bracts oblong, glabrous above, subciliate: ovary elliptic, glabrous: stigmas 3–4, broadly lanceolate from the base, revolutely recurved, pubescent: berries ovate, shortly beaked, black when dry: testa of the seed dark brown, shining, wrinkled.

My only specimen of this plant is a male one, the counterpart of which it would appear Dr. Miquel had not seen as his description altogether refers to the female plant. So far as the habit and foliage is concerned it seems to agree with the character of the species, but it looks so like the following, that I almost suspect they are the male and female of the same species.

1942. Piper hymenophyllum (Miq.), younger branches petiols and nerves on the under surface of the leaves, crisply roughish (crispatulo-hirtillis): leaves thinly membranaceous, transparent, elliptic, attenuately acuminate; acumen pointed or slightly blunt; base acute, equal-sided, quintuple-nerved; the lower nerves very slender, the upper ones, by interlacing, stronger, scarcely extending to the point: peduncles twice as long as the petiols: female catkins about the length of the leaves: bracts linear oblong, adnate, undulated, stigmas 3–4.

Courtallum.

As already remarked, this seems to me the female of the preceding, and, so far as description goes, it does not appear to differ from the plant defined. I fear too much stress has been laid on characters taken from the relative lengths of the inflorescence and leaves, and on the forms of the bracts, in the discrimination of the species of this genus. I make the remark mainly for the purpose of directing attention to the subject.

1943. Muldera Wightiana (Miq.), leaves ovate or ovato-elliptic, obliquely and acutely acuminate; equal and roundish at the base, septuple-nerved, the three middle nerves continued to the apex, (reddish beneath) membranceo-coriaceous, pellucido-punctuate: male catkins long peduncled, filiform, longer than the leaves, many-flowered: cups reflexed, clavate; opening transversely near the apex; hairy within.

Courtallum, in dense forests, flowering during July and August.

The above character applies to the male plant—that on the righthand side of the plate. The other, the female, seems to differ a little, but is I think the same species, though, I strongly suspect it is the *M. galeata* of Miquel. I have specimens of the female form from both the Neilgherries and Courtallum. On the supposition that it is indeed that species, I subjoin Miquel's character of it.

Muldera galeata (Miq.), leaves broad or lanceolato-elliptic, somewhat acute and acuminate, slightly unequal-sided, obtuse or acutish at the base; septuple- or quintuple-nerved, the middle nerves free from a little above the base extending to the apex, some-

what stiffly coriaceous, pellucido-punctuate: female catkins long peduncled, shorter than the leaves, glabrous: flowers rather remote: cups obliquely clavate, the exterior lip galiate, the interior smaller: ovary depressed, globose: stigmas 3-4, small.

The female figure of the plate seems upon the whole to correspond pretty well with this character, though there are undoubted discrepancies; these however will, I suspect, on comparing a number of specimens, be found referable rather to individual peculiarities of specimens than to specific differences.

1944. Muldera trichostachya (Miq.), upper leaves lanceolate or oblong lanceolate, equal-sided, moderately acutely acuminate, base equal, obtuse or acute, quintuple-nerved, coriaceous, pellucido-punctuate; peduncles glabrous, about the length of the petiols: male catkins elongated: cups obliquely sub-globose, constricted at the base, puberulous or hairy within.

Malabar, in forests climbing on trees. This species seems very distinct from *M. Wightiana*, as shown by the shape of the flower cups.

1945. Chloranthus Indicus (R. W.), shrubby, ramous: leaves short petioled, broadly oval, obtuse at both ends, crenately serrated, glabrous; peduncles terminal, spicately panicled: flowers numerous, sessile.

The order *Chloranthaceæ* is a small one, consisting of 4 or 5 genera, and distinguished like most of the peppers by having neither calyx nor corolla.

Chloranthus is distinguished from the following by having a broadly dilated 3-lobed filament which seems to perform the functions of a perianth. The middle lobe bears a perfect 2-celled anther, and each of the lateral ones a one-celled one, or half anther, so that in place of the genus being triandrous, as usually described, it seems more properly diandrous with the posterior anther split into two halves. This is shown in figures 5 and 6 of the plate. The species here represented may perhaps prove Blume's *C. officinalis* which I have not seen, neither have I access to his character.

Sarcandra (Gardner, Cal. Jour. vol. 6, p. 348.)

Gen. Char. Flowers hermaphrodite, sessile in a boat-shaped bract. Perianth none, stamen one, inserted on the ovary; filament thick and fleshy; anther introrse, 2-celled, opening longitudinally. Ovary 1-celled, with a single pendulous ovule; stigma sessile, depressed. Drupe 1-seeded, putamin thin, fragile, seed pendulous, testa membranaceous, embryo antitropous, enclosed in a fleshy albumen, radicle inferior.—A shrub, branches nodosely articulated: leaves opposite, petioled, penninerved, coarsely glanduloso-serrated; petiols uniting at the base into a short stem-clasping sheath: inflorescence terminal, paniculately spiked.

1946. Sarcandra Chloranthoides (Gardner).

Ceylon, Pulney Mountains, Courtallum, &c.

This is a rather common shrub in the sub-alpine jungles of the places indicated. In the figure—which was not prepared under my superintendence and, as regards the fruit, from imperfect specimens—the artist has not understood the sections of the fruit, which I find he took from specimens in a state too young for satisfactory dissection. The figures 5, 6, and 8 are all wrong and ought not to have been introduced into the plate.

1947. Callitriche Wightiana (Wall.), stems depressed, creeping: leaves all obovate, tapering at the base, obtuse, 3-nerved: flowers nearly sessile; the pedicels without bracteoles: fruit of 4 equal lobes, each with a winged keel at the back; pericarp membranous and cellular.

Frequent on the Neilgherries, in swampy ground and streams.

1948. I. II. Ceratophyllum muricatum (Cham.), fruit elliptical, slightly compressed, furnished with 3 (or occasionally 4) spines, winged, not gibbous; spines slender, weak; wing narrow, regularly many-toothed; sides of the fruit convex, more or less muricated, particularly towards the apex.

Tanjore and Coimbatore in wells. Figure I., in the accompanying plate, was taken from recent specimens gathered in Coimbatore. Figure II., from the specimen from which the above character was taken. There are some differences in the aspect which however do not appear of specific value.

1948. III. Ceratophyllum tuberculatum (Cham.), fruit ellipsoidal, slightly compressed, not gibbous, furnished with 3 spines, wingless; spines at first slender and weak, afterwards strong; sides of the fruit convex, finely tubercled.

Tanjore in Wells.

1948. IV. Ceratophyllum missionis (Wall.), fruit ellipsoidal, slightly compressed, not gibbous, furnished with 3 spines, winged; spines elongated, lateral ones flattened; the wing broader downwards and decurrent along the base of the spines, with a few irregular teeth: sides of the fruit convex, finely tubercled.

This and the last do not appear to have been distinguished by the Missionaries: at least the specimen sent by Klein to Willdenow belongs to the one, while those from his (or the Madras) herbarium before us have the fruit of the present species: except in the presence or absence of the wing there is, however, no difference, and we have merely separated them in deference to Chamisso's observations on the genus. Perhaps the whole three species ought to be combined as varieties under Roxburgh's name of *C. verticillatum*, characterized as a species by the ellipsoidal, tubercled or muricated, 3-spined, not gibbous, fruit. W. & A. Prod. 310.

1949. Macaranga. For explanations of this plate see vol. 5, Part 2d, page 23, under No. 1883, where specific characters of each of the subjects here represented are given.

1950. Sapium Indicum (Willd.), leaves, ovate, oblong, acuminate, acutely serrated, biglandulose at the base: spikes solitary, male flowers fascicled, triandrous: bracts supported by two fleshy glandular bodies: calyx 3-parted, lobes cordato-ovate, fringed: styles subulate, stigma simple, pointed.

Mergui, Griffith. According to Roxburgh the juice of this tree is reckoned very poisonous. It is a native of the Delta of the Ganges, and, if Rheede's figure (Hort. mal. 4 tab. 51) be really this tree, also of Malabar.

B

The dissections of the male flowers are taken from unexpanded buds: the filaments therefore are shorter than the perianth, in full grown ones they are longer.

1950–2. SAPIUM BACCATUM (Roxb., *S. populifolium*, R. W. in Icon.), arboreous, dioicous, ramous: leaves long petioled ovate oblong, acuminate, entire, glabrous, pale beneath: panicles axillary and terminal, spicate; flowers fascicled, very minute, pedicelled, diandrous: female racemes terminal and axillary, shorter than the males: ovary 2-celled with a single ovule in each, berries globular, seed solitary.

Mergui, Griffith. I am indebted to the late Mr. Griffith for the specimen represented, from which the character of the male plant is taken, that of the female is taken from Roxburgh.

When naming the drawing I thought my plant different from Roxburgh's and named it accordingly, a second and more careful comparison with his excellent description satisfies me that it is the same as his. I therefore request the name on the plate may be altered as above.

1951. SAUROPUS RETROVERSA (R. W.), shrubby: leaves distichous, short petioled, ovato-lanceolate rounded at the base, acute or somewhat acuminate, glabrous on both sides: peduncles axillary, short, many-flowered: flowers somewhat fascicled, opening in succession, longish pedicelled, drooping, calyx tubular, inverted, or turned back on the pedicel so as to place the stamens on the apex: stamens 3, filaments united at the base into a column, female flowers —— ?

I only know this plant from specimens gathered many years ago in Ceylon; they are without female flowers, hence it may be diæcious, though I think that scarcely probable. The curious feature in its structure is the calyx which is tubular, but becomes turned inside out and turned back, thus bringing the stamens to the surface.

1951–2. SAUROPUS GARDNERIANA (R. W.), shrubby: leaves broadly ovate or nearly oval, sub-cuspidate, glabrous on both sides; peduncles axillary, short, many-flowered flowers, fascicled or opening in succession, pedicelled: calyx spreading, obsoletely six-lobed: female flower six-cleft: fruit about the size of a black currant.

Ceylon, Gardner. The specimens from which my rather imperfect figure was taken, were communicated by the late Mr. Gardner, labeled, "742. *Sauropus*, Hautane."

They are rather imperfect, especially as regards female flowers, and having only a solitary fruit.

1952. SAUROPUS ZEYLANICA (R. W.), shrubby: leaves ovato-lanceolate, acute, rounded at the base: peduncles axillary, short, several-flowered, calyx six-lobed, lobes obtuse or sometimes acutish, spreading: female —— ?

This I also gathered in Ceylon many years ago, the specimens seem to be without female flowers. The lobes of the calyx are represented too acute and prolonged in the plate, or if correct in that particular instance the form is not constant as I find them in other flowers much more obtuse: this however seems quite distinct from both the preceding species, but most nearly approaches, *S. Gardneriana*.

1952–2. SAUROPUS INDICA (R. W.), shrubby: leaves varying from ovate acuminate to ovate lanceolate, acute at both ends: peduncles axillary, short, few-flowered: calyx sinuately 6-lobed; lobes obtuse: ovary 3-celled; styles 3, distinct, stigmas dilated: fruit about the size of a small gooseberry.

Courtallum and Shevagherry Hills, flowering August and September, but not apparently in its most perfect state as the specimens are not very good as regards either flowers or fruit. It is somewhat variable in the form of the leaves. It approaches the *S. Zeylanica* in appearance, but is certainly, I think, distinct. The genus however is as yet comparatively unknown, so that we have still to learn the true specific characters. I have looked principally to the calyx for them.

1953. SALIX ICHNOSTACHYA (Lindley in Wall. L. without a character), arboreous, leaves ovato-lanceolate, acute or acuminate, crenately serrated; shining above glaucous beneath: bracts short, obtuse, hairy: male flowers pentandrous; female sub-sessile: capsule 4-seeded.

Mysore, Shevaroy Hills, near Salem. The principal distinguishing features between this and the following are found in the form of the bracts, the fewer stamens, the sub-sessile female flowers, and more coriaceous leaves.

1954. SALIX TETRASPERMA (Roxb.), leaves lanceolate acuminate, finely serrulate: bracts 2-lobed, upper one much larger, boat-shaped, slightly dentate on the margin: stamens about 8, much longer than the bracts: ovary pedicelled: stigmas 2, spreading, apparently 4-lobed: capsule pedicelled, 2-lobed, cells 2-seeded.

Ootacamund, Coimbatore, and elsewhere. To what extent the above characters would seem to distinguish this from the numerous species of the genus, I am unable to say, but they are quite sufficient to distinguish it from the preceding.

1955. GNETUM FUNICULARE (Buch. Smith, *G. scandens?* Roxb.), arboreous, scandent or climbing: leaves opposite, oval, or somewhat obovate, abruptly cuspidato-acuminate, glabrous: catkins axillary, cylindrical, longish peduncled, solitary or several aggregated in the same axil: fruit obovate oblong, somewhat larger than a large olive.

Malabar, in alpine jungles, also sparingly on the eastern slopes of the Neilgherries where I have seen a tree of it climbing to the top of a very large banyan (*Ficus*, species not ascertained), where the extreme branches hang down to the extent of, I suppose, some 20 or 30 feet.

The above description of the fruit is principally taken from Rheede's plate, the fruit on my specimens not being sufficiently advanced. Smith's character of the species I do not understand: "lateral veins of the leaves separate to the margin," and again, "the leaves are 4–5 inches long, various in breadth, pointed, firm, shining, distinguished by their veins continuing distinct to the edge of the leaf." As in a matter so simple it is scarcely possible he could have been mistaken, and as, in the specimens now before me, which quite correspond with Rheede's figure, I find no such peculiarity, the veins being distinctly reticulated on the margin, I fear we have got dif-

ferent species before us, a point which can scarcely be determined until our respective specimens are compared.

In its woody structure this plant presents a close affinity with *Peppers*, transverse sections of the two being almost undistinguishable.

1956. TETRAMELES GRAHAMIANA (R. W., *Anictoclea Grahamiana*, Nimmo in Graham's catal.), leaves long petioled, cordate, short acuminated, serrated: male flowers panicled, panicles terminal, corymbose, females racemose; racemes long pendulous.

Courtallum, Malabar, Ghauts, &c.

I have followed Mr. Nimmo in the specific name, though I suspect this is not distinct from *T. nudiflora*, Brown. The specimens from which the drawing was made were gathered at Courtallum, but I received others from Mr. Graham of Bombay, but all without leaves.

1957. ARTOCARPUS (Jaca) HIRSUTA (Lam., Roxb.), leaves elliptic, obtuse, or rounded at both ends, glabrous above, hairy, especially on the nerves, beneath: male catkins long cylindrical, about the thickness of a quill, at first ascending or erect, afterwards becoming pendulous: females oval, about the size of an egg: fruit globose, echinate.

Malabar, on arid red soils, also in forests where it attains a great size, the trunk being large enough for canoes, for the formation of which the larger ones are principally used. The drawings embodied in the plate were made at different times: the figure of the tree and full grown fruit were taken from a tree growing near Trevandrum in May; that of the flowering branch was executed at Tellicherry by the same artist (Rungia), but not under my inspection. I, however, believe them correct, though at variance with Roxburgh's description and Rheede's figure, as regards the direction of the male catkins, the difference being referable to the difference of age. The tree figured is not a very good specimen, and I now suspect the likeness is not very good, but being the first I had seen I thought it well to have a sketch.

1958. ANTIARIS SACCIDORA (Dalzell, *Lepurandra saccidora*, Nimmo in Graham's Cat.), arboreous: leaves ovate, oblong, acuminate, entire, glabrous above, slightly villous beneath: capitula axillary, aggregated; peduncles about the length of the pedicels.

Malabar, Ceylon, flowering during October. The specimens from which the drawings were made were obtained from Coorg.

The above specific character will require to be modified when we become better acquainted with the whole genus.

1959. CONOCEPHALUS NIVEUS (R. W.), arboreous, erect, ramous: leaves ovato-lanceolate, acute or acuminate, quintuple-nerved, acutely serrated, somewhat bullate above; prominently reticulate and white beneath, strigosely hispid on both sides; inflorescence axillary, cymose: fruit capitate, drupaceous, drupes small, yellow, globose.

Eastern slopes of the Neilgherries, frequent, common also in many sub-alpine jungles. It extends as far south nearly as Cape Comorin in the jungles along the lower slopes of the hills. On the Neilgherries it is met with at an elevation of about 5000 feet. This small tree seems so much to resemble Roxburgh's *Urtica pulcherima* that, for a long time, I thought it that plant. It does not, however, seem to have been known to Roxburgh, as it does not correspond with any of his descriptions.

Fruit capitate, made up of an aggregation of small globose drupes. Sarcocarp fibrous, pulpy, studded over with minute resinous translucent tubercles; testa ovate, hard; albumen copious; embryo straight, as long as the albumen, radicle pointing towards the apex of the seed. Albumen oily: filaments straight in æstivation.

1960. CUDRANIA JAVANENSIS (Tricul, Annal des Sciences), leaves oblong lanceolate, entire, rounded at the base or acute, acuminate at the apex, mucronate, glabrous on both sides.

The specimen from which the drawing was made I received from the Calcutta Botanic Garden, labeled *Morus scandens*, a Chinese plant and may not, though it agrees pretty well with the character, be the true *C. javanensis*.

1961. EPICARPURUS ORIENTALIS (Blume, *Trophis aspera*, Willd., Roxb.), arboreous, leaves alternate, short petioled, obovate, cuspidato-acuminate, serrated towards the apex, very rough above: male flowers capitate, heads axillary, aggregated, short peduncled: females axillary, 1 or 2 together, longish pedicelled: fruit drupaceous, 1-seeded: testa crustaceous: cotyledons very unequal-sized, exalbuminous; radicle pointing towards the apex of the seed.

A common small rigid stunted looking tree, common all over India. Blume has mistaken the structure of the seed, which he describes as albuminous with a curved inverted embryo and cochleate cotyledons, in place of which it is composed of one very large cotyledon split half through and a very small one completely inclosed in the slit and concealed by the larger one. To bring it into view, it is necessary to tear off half the larger one as shown at figure 12, when the true structure at once becomes obvious. Figure 10 shows the seed as described by Blume, where the smaller cotyledon assumes the appearance of a small embryo with cochleate cotyledons.

1962. EPICARPURUS SPINOSA (R. W., *Trophis spinosa*, Roxb. not Willdenow), arboreous, thorny: leaves oblong lanceolate, coarsely serrated towards the apex, glabrous: male flowers aggregated in the axils of the leaves and thorns: female flowers 1 or 2 together, axillary; calyx deeply 5-parted, lobes lanceolate, acute, much longer than the fruit.

Courtallum, Ceylon. This seems a very rare plant in the Peninsula, as I do not recollect having seen it in any other station, and there it was a low thorny shrub.

The plant figured in the left hand corner of the plate is a new species of *Epicarpurus* from Ceylon, communicated by Mr. Thwaites with the following character, since published in Hooker's Kew Garden Miscellany, vol. 4, page 1.

EPICARPURUS ZEYLANICUS (Thwaites, Arnott). A ramous shrub, sparingly armed: leaves rhombio-lanceolate acuminate, glabrous, remotely spinuloso-serrate: male flowers densely capitulate, heads oblong: females racemose: fructiferous pedicels thickened at the apex and elongated.

1963. PLECOSPERMUM SPINOSUM (Tricul, *Batis spinosa*, Roxb., *Trophis spinosa*, Willd.), sub-arboreous, diffuse, branches armed with long, sharp, somewhat reflexed spines: leaves obovate, oblong, glabrous, shining: male flowers capitate, distinct; female ones aggregated, immersed in a fleshy head: styles long filiform: cotyledons unequal, folded, the larger one enclosing the smaller.

A rather common plant in thick jungles near the coast, it also occurs in the interior, but less frequently.

1964. DORSTENIA INDICA (R. W.), herbaceous at first, procumbent and rooting, afterwards ascending, erect: stem and petiols pilose: leaves penninerved, elliptic or elliptico-lanceolate, unequally serrated towards the apex, sparingly hairy above, more thickly on the veins beneath: peduncles axillary, solitary, cernuous or drooping: receptacle peltate, variously lobed on the margin.

In moist shady woods on the Pulney Mountains, Courtallum, Neilgherries.

The plant found in these various localities seems to be quite the same species, though it varies a little in its habit and aspect; in some specimens the fruit is more erect than those shown in the figure, which seem to me rather too decidedly drooping as if the drawing was made from plants beginning to soften and wither; but with that exception, the figure correctly represents a rather luxuriant form of the species.

1965. POGONOTROPHE MACROCARPA (Miquel), arboreous, climbing: ramuli, petiols and under surface of the young leaves pubescent: leaves long petioled, ovate-equal, or somewhat unequal-sided, abruptly narrow acuminate, rounded at the base, 3–5-nerved, 2–3, costulate, fugaciously puberulous above: receptacles glomerate, globose, pubescent, spotted. Fruit green, white spotted, size of an orange.

Pulney Mountains, in woods climbing on other trees, in fruit during October.

Miquel, when he referred this plant to his genus *Pogonotrophe*, had not seen the drawing of the fruit, nor had he dissected it, whence I infer his reference of this plant to that genus is a mere guess. The drawing from which my plate is taken was made on the spot, but most unfortunately without an analysis of the contained flowers, whence I am unable to determine with certainty its genus, but infer from its habit and general aspect that it is more properly referable to *Covellea* than *Pogonotrophe* and, as such, seems very nearly allied to the following.

1966. COVELLIA GUTTATA (R. W.), arboreous, scandent, the branches afterwards ascending: branches glabrous and smooth, young ramuli pubescent: leaves ovate cordate, acuminate, 3-nerved, entire, smooth and glabrous above, villous beneath: receptacles glomerate on the older branches, pubescent: perianth six-lobed, lobes lanceolate, equaling or exceeding the length of the ovary: stigma dilated, ciliate, umbilicate.

Orange Valley near Kotergherry, Neilgherries, on the banks of the stream, flowering August and September. In the receptacles, cut for examination, no male flowers were found, hence this appears a dioicous species. It seems very distinct from all those defined by Miquel.

1967. UROSTIGMA RELIGIOSUM (Gasparrini, Miq.), leaves long petioled, ovate cordate, narrow acuminate (acumen ⅓ the length of the leaf) entire, or repandly undulate towards the apex: sinus at the base broad or truncated.

A common tree all over India, and so much respected by the natives that they will not willingly injure or cut it down, even to clear a line for a road, and I have known them rather work round one than cut it down. There are two nearly allied species with which it is liable to be confounded, but I believe the one represented is the genuine form.

1968. HOLOPTELEA INTEGRIFOLIA (Planch. Annal. des Sciences, Nat. Ser. 3. v. 10, *Ulmus integrifolia*, Roxb.).

A considerable tree not uncommon along the foot of the Hills and pretty generally, though sparingly, distributed over the Coimbatore district. Leaves distichous, entire, alternate, ovate, or cordato-ovate, obtuse, shining: flowers fascicled, appearing during the spring months when the tree is nearly destitute of leaves, male, female and hermaphrodite flowers, mixed in the same fascicles. Calyx 4–8-parted, hairy: stamens 7–9, scarcely longer than the calyx: ovary pedicelled, oval, compressed; styles two, nearly as long as the ovary, fruit compressed, winged all round, seed —— ?

The specimens represented are too young to show the mature fruit, to do justice to which would require a separate plate, neither were the available fruit sufficiently mature to admit of the seed being properly analysed.

This tree has been removed from the old genus *Ulmus*, by M. Planchon, principally on account of its polygamous flowers and deeply parted calyx, added to some differences in the structure of the seed. As yet it stands alone in the genus. The analyses of the ovary and fruit are less perfect than I could have wished, but in other respects the figures are good.

1969. CELTIS WIGHTII (Planchon, l. c. p. 307), leaves oblong, abruptly acuminate, somewhat acute at the base, quite entire, 3-nerved; lateral pair of nerves extending from the base to the apex: stipules produced below their point of insertion (that is, somewhat peltate): cymes polygamous (male and hermaphrodite), about the length of the petiols or sometimes twice as long: berry ovate; shortly rostrate, smooth.

An extensively distributed small tree or large shrub; frequent in the sub-alpine jungles covering the slopes of the hills, and on the Neilgherries ascending to an elevation of from 4000 to 6000 feet. Flowers pale bluish, flowering September and October, or probably nearly throughout the year.

1970. CELTIS SEROTINA (Planch. l. c. p. 301), leaves obliquely ovate, acuminate, acute at the base, serrated from the apex to below the middle, glabrous; inflorescence axillary or from the axils of fallen leaves: fructiferous pedicels usually 3 together, one free the other two united at the base: berry nearly oval, glabrous.

A considerable, and when in full leaf, a handsome tree, flowering during the spring months while the young leaves are developing. It is extensively distributed over the plateau of the Hills, but some of the finest specimens I have seen of it are growing on the bank in front of Stonehouse. The specific

name, which is in allusion to its not flowering until the leaves have attained their full growth, is not correct as it flowers simultaneously with their development, and sometimes in anticipation of them.

The difference of the leaves on flowering, as compared with the fruit branch, will show that such is the case.

1971. SPONIA WIGHTII (Planchon, l. c. p. 322), arboreous, young branches petiols and nerves on the under surface of the leaves strigosely hairy: leaves ovate oblong, cuspidate, somewhat unequal-sided, acute or occasionally cordate and about equal-sided at the base; the younger ones silvery-silky white beneath, the adult ones adpressed, puberulous: cymes short peduncled, about as long as the petiols, the male ones compact, females looser, stigmas about as long as the immature fruit, clothed with long hair-like threads (longe filamentosis), the lower threads often resting on the apex of the berry. *Planch.*

A small tree, not unfrequent throughout the southern provinces. I have long confounded this tree with *Celtis orientalis*, Linn., Roxb., and others, from which, however, M. Planchon has separated it, limiting the Linnæan plant to Ceylon. Comparing, however, the character of the style and stigma of this with his character, there seems reason to believe, either that it is variable in that particular, or that there are still two species confused, or, what seems not improbable, that this is but a variety of the Ceylon plant, the two generally agreeing so well with the other. I make the remark in the hope of directing attention to the subject, as I can now scarcely hope to profit by it myself. The figure, so far as it goes, is good.

URTICACEÆ.

AT the present time this is a most difficult family to deal with, not that the species and genera are less distinguishable than those of other families, or because the distinguishing marks are less obvious, but because the old and very complex genus, *Urtica*, has been split into many genera, but as yet without any comprehensive revision and readjustment of the species. What is wanted is a monograph of the order by a competent Botanist, having free access to the rich collections of Europe, so that each, already, named species might be correctly referred to its new genus and defined with reference to its fellows. At present this can scarcely be done even with old and well known species, and much less so in the case of imperfectly known ones. Under these circumstances the following characters can, at best, be viewed as only provisional short descriptions of the plants, rather than specific characters, for, not having other defined species, appertaining to the same genera, with which to compare mine and thereby indicate their distinguishing marks, I can only note their prominent features, leaving the monographer to select from my descriptions those points necessary to distinguish them from others agreeing with them in their generic relations. My series of Indian species of the genus *Pouzolzia* being more complete than those appertaining to the other genera, and having access to an imperfect monograph of the genus, I have ventured on the attempt of preparing a more perfect one. It must obviously be still very imperfect and may possibly be found to contain many errors, but as such contingencies are common to all first attempts of the kind, I am encouraged to make the attempt in the hope that whatever its imperfections, it may still prove useful to at least Indian Botanists until they are furnished with a more correct one. And I am not without the expectation that it may lighten the labours of any European Botanist who may be induced to take in hand the elaboration of the whole order.

1972. LAPORTEA TERMINALIS (R. W.), herbaceous, dioicous, or rarely monoicous, erect, every where beset with long sharp stinging bristles: leaves alternate, long petioled, ovate acuminate, acutely mucronate, serrated, very rough above, smoother and glabrous except the bristles beneath: inflorescence panicled, male panicles in the lower axils, compact, about the length of the petiols; flowers sub-sessile: calyx 5-parted: stamens 5, with a globose rudimentary ovary in the centre: female panicles two or three from the axils of the upper leaves, long peduncled, loose: flowers pedicelled, pedicels at length winged: calyx 4-sepaled, the two lateral ones much larger, ovate obtuse: style longish; stigma acute: achenium pedicelled, drooping, ventricose below, straight above, compressed, somewhat tuberculate: seed compressed, exalbuminous: cotyledons foliaceous, radicle next the apex of the seed.

Neilgherries, in thick woods, flowering October and November. Abundant on Elk Hill. I took advantage of an unusual specimen to show the relative positions and forms of the male and female panicles. It stings severely, and the tingling continues for a long time, but possesses very little of the intense virulence of *L. crenulata*.

1973. PILEA TRINERVIA (R. W.), herbaceous, erect, every where glabrous, stems very succulent and juicy: leaves opposite, longish petioled, ovato-elliptic, 3-nerved, acuminate, deeply and acutely mucronato-serrated; smooth, shining, deep green above, paler and dull below; nerves prominent: panicles axillary, loose, shorter than the leaves, monoicous: male flowers, calyx 4-parted; stamens 4: female, calyx 3-lobed: 3 foliaceous abortive stamens: achenium ovate, erect, obtuse, compressed, smooth. Seed exalbuminous; radicle pointing to the apex of the seed.

Neilgherries, very abundant in damp woods. A very juicy, soft, tender plant, growing most luxuriantly in every wood about Ootacamund and in full flower during the rains. It is destitute of both pubescence and bristles. This is not the *Urtica trinervia* of Roxburgh, which is, I believe, a *Boehmeria*, neither is it confined to these hills, for I have specimens from other alpine stations.

1974. PILEA RADICANS (R. W.), herbaceous, procumbent and rooting at the base, afterwards ascending: leaves opposite, short petioled, cordato-ovate acute, deeply serrated, 3-nerved, glabrous and smooth on both sides, deep green, membranous: panicles from the axils of the upper leaves, dichotomous, long peduncled: male flowers 4-androus: female 3-lobed with three abortive membranous stamens exceeding the lobes of the calyx: style none, achenium ovate, compressed, smooth.

Neilgherries, in dark moist woods and with the preceding to be met with in almost every wood on the higher ranges of the Hills. I have specimens, however, from other quarters.

C

1975. Fleurya interrupta (R. W., *Urtica interrupta*, var. *laxiflora*, Lin., scarcely of Roxburgh). Herbaceous, erect, bristly all over, the young branches and under surface of the leaves, especially on the nerves, pubescent: leaves long petioled, cordato-ovate, acute or acuminate, coarsely serrate, somewhat triple-nerved: peduncles axillary, solitary, about as long, or sometimes longer than the leaves, bearing at unequal distances small lateral panicles: panicles either contracted and sub-capitate, or more fully developed and loose: male calyx 4-parted: stamens 4: female 4-cleft embracing the base of the ovary, afterwards open: style filiform; stigma acute: achenium ovate compressed, winged round the margin, tuberculate on the disks, which in the dried seed are depressed.

Paulghaut, &c. This plant is of frequent occurrence all over the Peninsula and, if Roxburgh's plant, figured No. 692, be the same, which I now begin to doubt, it extends far into Bengal. The form represented, assuming it to be the same species as 692, is so very distinct in the character of its inflorescence as to entitle it to a place here, were it merely to show how much the development of organs may be modified by circumstances. I consider the plant here represented as undoubtedly Linnæus', differing in the development of the small lateral panicles, a point in which it also differs from the figures of both Rheede and Burmann.

1976 ♂ ♀. Girardinia Leschenaultiana (Decaisne), leaves broad cordate, 7-lobed, lobes oblong, acute, coarsely serrated, serratures entire or dentate upwards, clothed on both sides with fine whitish down: above armed with thinly scattered prickles, beneath thickly beset with them: stipules lanceolate acute, scariose, brown.

Frequent in the woods all over the higher range of the Hills. This is, I believe, the *Urtica acerifolia* of Zenker.

The bark yields a fine and strong flax, which the indigenous inhabitants obtain by first boiling the whole plant, to deprive it of its virulently stinging properties, and then peeling the stalks. I am not acquainted with the after processes, but the textile material so obtained, when nicely prepared, is of great delicacy and strength. Until of late all the species of this genus, which certainly greatly resemble each other, were confounded under the name of *Urtica heterophylla*. I suspect it is now split into too many species.

1977. Splitgerbera macrostachya (R. W.), suffruticose, erect, pilose all over: leaves long petioled, opposite, cordato-ovate, acute, 3-nerved, serrated: spikes axillary, filiform, interrupted, three or four times the length of the leaves: male fascicles 6–8-flowered; female 10–12 or more, male calyx 4-parted, lobes 2-toothed; stamens 4, with a rudimentary ovary: female calyx tubular, ventricose, contracted, 4-toothed at the apex, enclosing the ovary; style long filiform; stigma simple, acute, villous: seed oval, erect, enclosed within the calyx, exalbuminous, radicle superior.

Coimbatore district, Neilgherries, Courtallum, &c., usually in moist soil seeking the shade and protection of bushes and trees. Of this genus I have several undescribed species from different parts of the Peninsula and Ceylon. Roxburgh's *Urtica scabrilla*, No. 691 of this work, belongs to this genus.

1978. Pouzolzia Bennettiana (R. W.), fruticose, erect, sparingly branched; stem and upper surface of the leaves somewhat rough: leaves usually ternate, uniform, short petioled, 3-nerved, ovato-lanceolate, slightly unequal-sided, rounded or subcordate at the base, taperingly acuminate, softly pubescent or subtomentose beneath, pilose above: flowers axillary, aggregated, male and female mixed: male pentandrous, fruit ovate and ribbed in the lower axils, winged towards the extremities of the older branches.

Neilgherries, frequent among bushes in moist soil. When supported, 4 to 6 feet high. See monograph at the end of the volume.

1979–1. Pouzolzia integrifolia (Dalzel), leaves opposite, sessile, sub-cordate, broadest at the base, thence tapering to the point, sub-acuminate, united at the base by a broad stipule; sparingly pilose on both sides, roughish above: flowers axillary, sub-sessile; males tetrandrous or rarely triandrous: fruit 2–3, winged: wings ciliate.

Mountains of Malabar, flowering September. I am indebted to Mr. Dalzel for my specimens of this plant.

1979–2. Pouzolzia cymosa (R. W.), shrubby, ramous, erect or seeking the support of bushes: leaves sub-sessile, opposite, many-nerved, pubescent on both sides: male inflorescence cymose; cymes axillary, paired: flowers pentandrous: fruit axillary, sessile, one or two between the male peduncles, ovate, ribbed, wingless.

Eastern slopes of the Neilgherries, flowering during the autumnal months; usually among bushes whose support it seeks, and then attains to the height of 3 or 4 feet.

1980–1. Pouzolzia Indica (R. W., *Parietaria Indica?* Lin.), ascending, lax; leaves triple-nerved, alternate, short petioled, uniform, but reduced in size towards the ends of the branches, ovato-lanceolate sub-acuminate, pilose: flowers few, axillary, glomerate, tetandrous; fruit ovate, 8-ribbed, apiculate.

The figure and character of this plant is taken from an indifferent specimen gathered in China by Mr. Dorward of the Madras Medical Establishment. As it agrees pretty well with Rumpheus' figure, vol. 6, tab. 12, f. 2, I have been induced to consider it identical with the Linnæan species.

1980–2. Pouzolzia auriculata (R. W.), erect, ramous, branches terete, hoary towards the extremities: leaves triple-nerved, alternate, longish petioled, lanceolate, acute at both ends; roughish above, pubescent beneath: flowers sessile, glomerate, pentandrous: fruit 4-winged; wings enlarging from the base upwards, sub-orbicular, auricle-like.

Neilgherries, Iyamallay Hills, near Coimbatore, flowering August and September.

1980–3. Pouzolzia rostrata (R. W.), erect, ramous; stems glabrous: leaves longish petioled, triple-nerved, alternate, membranous, glabrous on both sides; flowers glomerate, sessile, pentandrous: fruit 4-winged, ending in a prominent hairy beak. Wings rather small and coriaceous.

Malabar, a very distinct species.

CHAMABAINIA (R. W.)

GEN. CHAR. Monæcious. Male calyx 4-cleft, lobes all equal. Stamens 4, inflexed in æstivation, rudimentary ovary clavate. Female: two or three sessile flowers aggregated on the axil or within a bract. Sepals two, minute. Style very short; stigma somewhat capitate, penicillate. A achenium ovate. A low, herbaceous, ramous, diffuse, creeping plant, rooting at the joints, branches ascending: stipules 4 large scariose at each joint: leaves opposite, petioled, ovate, acute, serrated, 3-nerved, pilose on both sides: flowers axillary, fascicled; males and females mixed: males pedicelled, calyx deeply 4-cleft, lobes furnished at the apex with a bristly tooth-like appendage: stamens nearly twice the length of the calyx: rudimentary pistil clavate: female flowers in the same axils numerous, sessile, very minute, compactly aggregated in fascicles of two or more flowers embraced by a broad ovate, delicately membranous bract.

This part of the structure is not shown in the accompanying analyses where at fig. 5, a single flower is shown in place of several to the bract. In other respects the analyses are generally correct, with the exception of the short style and stigma, which is imperfectly represented. The genus is named with reference to its procumbent rooting habit—earthloving.

1981. CHAMABAINIA CUSPIDATA (R. W.), Neilgherries, in moist woods and in low wet ground near streams, &c.

1982. FORSKOLIA URTICOIDES (R. W.), procumbent, ramous, rooting below, branches ascending, slender, diffuse: leaves opposite, petioled, ovate or subcordate, serrated, pilose on both sides, but especially on the nerves beneath: involucres axillary, campanulate, 5-toothed, 4-flowered, 3 pedicelled male, and 1 sessile female: male calyx 2-lobed with 1 stamen, female tubular, enclosing the ovary, 5-toothed: style long, stigma villous, pointed: achenium ovate, glabrous.

Neilgherries, in damp shady woods about Ootacamund.

This, I believe, is the only Indian species yet discovered of this genus. *F. tenacessima* is found in Scinde, for specimens of which I am indebted to the kindness of Dr. Stocks.

1983. ELATOSTEMA CUSPIDATA (R. W.), dioicous, herbaceous, erect, sparingly branched: leaves subsessile, alternate, very unequal-sided, cuspidately acuminate, coarsely serrated; sprinkled with a few bristly hairs and closely lineolate above, pubescent on the nerves beneath: receptacles axillary, sessile, oval, peltate; furnished on the margin with some tooth-like appendages: some males, mixed with the female flowers, longer pedicelled; ovary ovate, base embraced by the 3-lobed calyx: style none, stigma pennicillate: seed ovate pericarp papery, splitting into two halves when pressed: embryo exalbuminous, radicle superior. (In figs. 5 and 7, of the plate, the artist has accidentally inverted the seed, representing the embryo pointing to the base.)

Neilgherries, in thick woods on the banks of streams and other moist ground.

In this plate the female plant only is represented; the male flowers shown, being imperfect ones, found mixed in the female receptacles. In the male plant the leaves are somewhat narrower, and not so deeply serrated.

1984. ELATOSTEMA LINEOLATA (R. W.), dioicous, herbaceous or suffruticose, erect, ramous, glabrous: leaves sessile, alternate, unequal-sided, abruptly acuminate, with a few serratures on the convex edge, coriaceous; glabrous on both sides: marked above with numerous thick white lineols: pellucid dotted: male: receptacles deeply 2-lobed, membranous: flowers numerous, each at first embraced by a membranous involucre, afterwards by the elongation of the pedicel, exserted; calyx 4-parted: stamens 4, involute in æstivation.

Neilgherries, Malabar, Canara, Ceylon, &c.

Though I have specimens from all the above stations, they are all males. The drawing was made nearly 10 years ago at Ootacamund and had I then had leisure to study the order, would doubtless have, before this time, found the female plant, but not having had that leisure, I all along supposed the drawing complete and did not discover its imperfection until the impression had been struck off. I hope to be able to remedy the imperfections of this and its two fellows in a subsequent plate. The three drawings were all made about the same time, and all similarly imperfect as representing only one sex.

1985. ELATOSTEMA OVATA (R. W.), herbaceous, dioicous or polygamous, erect; sparingly branched: leaves opposite, unequal-sized, ovate, acute, serrated, short petioled, pubescent, and sprinkled with stronger bristles above; glabrous, except on the veins, beneath; 3-nerved, the lateral pair very slender: receptacles axillary, pedicelled, fleshy: fructiferous flowers short pedicelled (mixed with numereous longer pedicelled imperfect ones), calyx 4-cleft; imperfect ones, calyx 4-parted; lobes cuspidate: male plant like the female, but larger, receptacles like those of the female except the total absence of female flowers.

Neilgherries, in wet soil, frequent in the woods about Ootacamund. Plant from 6 to 8 inches high, leaves from 1 to 1½ inch long, the larger ones about an inch broad, peduncles from ½ to 1 inch long, slender.

This and *Elatostema oppositifolia*, Dalzell (Hooker's Jour. 3, p. 179), are referable to the same section of the genus, but seem very distinct plants. They differ so much in habit from the preceding species that I almost doubt whether, on a complete revision of the order, they will be permitted to remain in the same genus. The male flowers of *E. lineolata*, with their conspicuous involucell and membranous involucre seem very distinct. I, however, with my present imperfect information cannot venture on any alterations.

1986. ASPIDOPTERIS GLOMERATA (R. W.), shrubby, climbing, glabrous: leaves coriaceous, short petioled, broad elliptic, sub-acute at both ends, slightly unequal-sided, faintly triple-nerved, quite entire: flowers glomerate, axillary or on the ends of rudimentary branches; glomerules short, clothed with tawny pubescence: pedicels slender, about the length of the petiols: calyx lobes oval, obtuse, sparingly ciliate, about ⅓ the length of the linear sub-obovate obtuse, petals: petals slightly pubescent within, about the length of the stamens.

Courtallum, Malabar, Mysore.

This species seems nearly allied to Mr. Dalzell's *A. canarensis* if indeed it be not a form of that very plant, but as it is said to have the flowers in simple racemes, and as I have specimens of this plant from

so many localities all agreeing, I cannot venture, until better informed, or until I have compared specimens, to unite them. I have not seen fruit of this species.

1987–88. Ancistrocladus Heyneanus (Wall.), shrubby, climbing: leaves sessile, oblong, obovato-lanceolate, cuniate towards the base, coriaceous, quite glabrous; when dry delicately reticulate above: panicles towards the ends of the hook-bearing branches, dichotomous: calyx and corolla about equal: stamens 10, alternately long and short, filaments of all dilated at the base: style thick, conical; stigmas three: fruit 5-winged, two smaller, one-seeded: seed corrugated, globose, somewhat depressed above.

Courtallum, and Malabar forests. I am indebted to the kindness of the Rev. Mr. Johnson of Cottayam for the specimens from which the drawing was made. This, I suppose, is Wallich's *A. Heyneanus*, a still undescribed plant which I have never seen, if this be not it. This seems nearly allied to *A. Vahlii*, but which is said to be pentandrous. In other respects the characters are very much alike.

1989. Urostigma Bengalense (Gaspar, Miquel, *Ficus Bengalensis*, Linn.), " leaves ovate, quite entire, obtuse," Lin., " stem rooting below," Lin., *Ficus Indica*, Roxb. "Branches dropping roots, which become as long as the original trunk: leaves ovate, cordate: fruit in sessile axillary pairs." Roxb.

Common all over India, often used as a road-side tree, generally to be met with about every town and hamlet.

Of this very celebrated tree no good modern figure exists, a hiatus I was anxious to fill, but having restricted the artist in the matter of room, the result has been less satisfactory than I could have wished, the plate being much too crowded. Except, however, in respect to appearance, the representation is correct and had it been coloured or the fruit shaded, even that defect would have been, to some extent, obviated. The mature fruit and the leaves are dark green. To see it properly, the plate requires to be viewed from the side, and ought to have had the name so written.

The specific name of this tree has long been subject of discussion; the question on the principle of priority is now set at rest. The above brief character taken from Linnæus, Sp. Plant., added to the figure quoted from the Hortus Malabaricus, leave no doubt of this being his *Ficus Bengalensis*, though I believe not the plant he intended.

It is certainly much to be regretted that he fell into the mistake, but such cannot now be easily got over, and therefore, must be submitted to with what grace we may. I certainly wish that Miquel, now the highest authority on this genus, had taken upon himself to add the weight of his authority to the wishes of Indian Botanists to correct the error which they all feel to have been inadvertent. But since he, in justice to the original founder of the name, has deemed it right to retain the original provincial one, to the exclusion of the more appropriate country one, others I fear must do the same. Under this view I have felt it incumbent on me, much against my inclination, to follow his example.

1990. Sponia velutina (Planch.), branchlets and leaves softly velvety; the clothing on the very young parts shining: leaves ovate oblong, cuspidately acuminate, slightly unequal at the base, cordate or rounded, serrated on the margin, above beset with rough points: cymes (male, female and polygamous), short peduncled or sub-sessile, equaling or twice as long as the petiols, many-flowered: male flowers exteriorly hairy: berries ovate, glabrous or sometimes sprinkled with a few hairs.

Coimbatore, Neilgherries, &c. This is a widely distributed tree. India generally, Madagascar, Burmah, China, &c.

1991. Antidesma acuminata (Wall. ? H.B. Cal.), shrubby or arboreous: leaves ovate oblong, acuminate, glabrous; stipules linear acute, sometimes subfalcate, unequal-sided: racemes axillary or terminal, sometimes branched: bracts ovate acute: flowers short pedicelled, crowded, male and hermaphrodite: males 3–4-androus with a free capitate rudimentary style, calyx deeply 3-parted setacio-dentate on the margin, stamens longer than the calyx: hermaphrodite, calyx 3 or 4 parted: stamens 3–4, about the length of the calyx, anthers 2-celled with a broad connective; ovary exceeding the calyx, 1-celled, ovules 2, collateral, pendulous from the apex, stigma 3–4-lobed.

Calcutta Botanic Garden, Malabar.

The figure is taken from a specimen, named as above, received from the Calcutta Botanic Garden, and I have since received others from Malabar. But for the latter I should scarcely have thought of introducing this plant. And had I, before naming the drawing, seen M. Tulasne's monograph of the order, I should perhaps have deemed myself justified in assigning a new generic appellation, on the ground of the fertile flowers being furnished with what appears perfect stamens. As, however, I have not seen the fruit, I refrain from now doing so, as the character must to that extent be imperfect, and I hope yet to have the deficiency supplied. In the mean time, as it certainly belongs to the order, it may be permitted to remain as a doubtful number of the genus.

Astylis (R. W.)

Gen. Char. Diæcious. Male; calyx 4-parted, imbricated in æstivation, lobes all equal. Stamens 5 to 8 inserted round a flat disk, lining the bottom of the calyx; anthers oblong, 2-celled, cells collateral: rudimentary ovary various, sometimes altogether wanting, sometimes very minute, and, in one flower I examined, fertile, that flower being perfectly hermaphrodite. Female; calyx 4-parted, lined with a disk, no rudimentary stamens: ovary free, one-celled; ovules two, pendulous from the apex of the cell: style none: stigma large, spreading, covering the whole of the apex of the ovary. Fruit ? —— A small very ramous tree, the extreme branches slender, gracefully drooping on all sides. Leaves alternate, oblong, ellipticо-lanceolate, acuminate, waved on the margin, entire, glabrous. Fowers axillary; males fascicled, short pedicelled; fascicles 4–8-flowered; the two exterior lobes of the calyx broad ovate somewhat boat-shaped, at first quite concealing the interior pair, all densely pubescent exteriorly, slightly downy within: stamens very variable in number, 5, 6, 7, 8 in different flowers picked from the same branch. Female flowers usually in pairs, pedicles about the length of the petiols, like the males except in difference of sex; of those examined none furnished rudimentary stamens.

This genus is, it appears to me, justly referable to *Antidesmeæ*, though, so long as the mature fruit remains unknown, a doubt must exist on that point. The difference of the anthers tends to strengthen that doubt, but those of the hermaphrodite flowers of the preceding plate help to reconcile us to the difference.

In the analysis the draftsman has been careless and has failed to show the disk of the male flower. It is similar to that shown in the female one.

1992. ASTYLIS VENUSTA. (R. W.)

Neilgherries, western slopes, growing near the banks of streams, flowering May and June. On the banks of the stream at Mr. Ouchterlony's coffee plantation.

1993. EUPHORBIA CATTIMANDOO (W. Elliot), shrubby or arboreous, erect, 5-sided with prominent repand angles; stipulary thorns paired, short subulate: leaves sessile, succulent, deciduous, obovate, subcuniate, cuspidate, glabrous: peduncles crowded, 3-flowered, the middle one usually sterile and the lateral ones fertile, sometimes the reverse, flowering after the fall of the leaf.

Vizagapatam district, in great abundance, flowering from March to May, or even the beginning of June.

This plant is so much like *Euphorbia trigona*, No. 1863, above, that I should scarcely have thought of introducing it here, but for the valuable product which it yields to the arts, and which, when better known, may be found but little inferior, for many purposes, to Gutta Percha. The drawing represents the plant in 3 states: 1st, quite naked as it appears before flowering; second, covered with flowers, and lastly as it appears in July and August covered with young leaves. In size it varies from 8 to 12 or 14 feet, rarely higher. The stem is 3–4 feet high surmounted by a round branchy head. The milk of this plant yields the product above referred to. It is obtained by cutting off the branches, when it flows freely. "It is collected and boiled on the spot, at which time it is very elastic, but after being formed into cakes or cylinders it becomes resinous or brittle, in which state it is sold in the bazaars and employed as a cement for fixing knives into handles and other similar purposes, which is effected by heating it. It is also employed medicinally, as an outward application in cases of Rheumatism. The piece I sent you was prepared by Mr. Healy, and was, I think, boiled in water. It is much superior to what is sold in the bazaar, but it has not the valuable property, like Gutta Percha, of being ductile at all times. It can be made to take any shape when first boiled, but as far as we know, not afterwards, though some plan may be found for making it more pliant afterwards."

The above notes were communicated by Mr. Walter Elliot. Judging from the above mentioned sample of the Cattimandoo, now before me, I should suppose that, were it in the hands of men accustomed to work in such material, it would soon be turned to valuable account. I find, when exposed to the heat of a fire or lamp it rapidly softens and becomes as adhesive to the hands as shoemakers' wax, but when soaked for some time in warm water (150° to 180°) then it slowly softens, becomes pliable and plastic and in that state takes any required form. But my experiments with it have been too few and cursory to admit of my drawing any conclusions from them, and I only mention them because they seem to encourage the hope that the concluding remarks of Mr. Elliot still want confirmation.

CHORISANDRA. (R. W.)

GEN. CHAR. Diœcious (always ?). Male: calyx six-parted with six depressed flattened glands. Stamens six, equal, free to near the base, alternate with the glands; filaments filiform subulate; anthers short, ovate, 2-celled; cells parallel opening longitudinally. Female: calyx 5-parted (always), lobes somewhat unequal: glands 5, alternate with the lobes of the calyx. Ovary 3-celled with 2 ovules suspended from about the middle of the axis in each: style short, 3-cleft, stigmas revolute. Capsule 3-celled, usually, by abortion, 3-seeded, splitting into six valves. Seed globose.—A low ramous shrub, 3–5 feet high. Leaves alternate, pinnate; leaflets alternate, oval, obtuse at both ends, glabrous. Male flowers axillary, aggregated in dense fascicles: calyx lobes imbricating in æstivation, reflexed when full blown: glands depressed, covering the bottom of the calyx and concealing the insertion of the stamens; flower buds globose. Female flowers few, one or two from the base of the petiols, long pedicelled. Capsule globose crowned with the persistent style; glabrous. The distinguishing feature of this genus is the number and freedom of the stamens; and the inflorescence is peculiar when viewed in connection with that of the sub-division of the tribe *(Phyllantheæ)*, to which it belongs. In truth it seems almost a Phyllanthus in habit.

1994. CHORISANDRA PINNATA. (R. W.)

Abundant in arid laterite soils along the western shores of the Pulicat lake, where it forms extensive low jungles (within about 20 or 25 miles in a north-west direction from Madras). It is also found in the Northern Circars whence I received specimens from Mr. Walter Elliot. Being thus extensively distributed I wonder that it still remains an undescribed plant, but yet I do not recognise it under any of either Willdenow's or Roxburgh's species, of either *Phyllanthus*, to which genus I think they would most probably have referred it, or in any other allied genus. As a genus, I feel certain it is not taken up.

WAGATEA. (Dalzell, Hooker's K. G. Miscel. vol. 3, p. 90.)

GEN. CHAR. Calyx 5-cleft, tube cup-shaped, limb deciduous, lobes imbricated in æstivation, the inferior one somewhat larger, concave. Corolla; petals 5, equal, uniform, unguiculate, inserted on the top of the tube of the calyx. Stamens 10, inserted with the petals, all fertile, alternately shorter. Ovary stipitate, 4–6-ovuled; style filiform; stigma hollow, 2-liped, fringed, upper lip half-orbicular, lower one larger, cucullate. Legume linear acute, coriaceous, transversely constricted between the seed, thickened on the margin, seed 3–4, obovate oblong, testa thick, hard and bony.—A scandent shrub everywhere, except the spikes, armed with recurved prickles. Leaves bipinnate; pinnæ 5–6 pairs; leaflets 5–6 pairs, subcordato-ovate obtuse or sub-emarginate, shining above, a little downy. Spikes terminal, long (1–2 feet); flowers numerous, close set, calyx bright red; petals orange yellow, and, being confined by the calyx lobes, never expand: stamens length of the petals, filaments hairy at the base, anthers roundish, ovary pilose; legume glabrous, thick and somewhat spongy.

D

This genus, of which Roxburgh's *Cæsalp. oleosperma* seems a second species, is nearly allied to my genus *Acrocarpus* (Icon. 254), and by its affinity confirms the view taken of the relationships of that genus.

1995. Wagatea spicata (Dalzell, Cæsalpinia digina? Law in Graham's catal., C. spicata, Dal. l. c.

Paulghaut jungles, Belgaum, Malabar mountains.

Many years ago I received specimens, but without fruit, of this plant from Mr. Law, forwarded from Belgaum. Last year I received one from some hill jungles near Paulghaut, but still without fruit. Subsequently I recognised, in Mr. Dalzell's graphic character, my old friend, and on application to him was immediately furnished with a legume to enable me to complete my drawing, which I have now had by me for at least 12 or 14 years.

Macclellandia. (R. W.)

Gen. Char. Calyx campanulate, 6-cleft. Corolla 6 petals; petals inserted on the margin of the calyx between the lobes, unguiculate. Stamens 12, inserted on the bottom of the tube of the calyx, alternately shorter, the longer ones alternate with the petals. Ovary free, stipitate, concealed within the tube of the calyx, one-celled; ovules numerous attached to a free central placenta: style filiform, at first incluse, afterwards, through the enlargement of the ovary, exserted; stigma umbilicate. Pixis globose, scarcely exserted. Seed very numerous, irregularly angled, cuniate; testa thick, soft and spongy: embryo exalbuminous, radicle pointing to the hilum.—A rather large, very ramous shrub, growing on the sea shore almost within high water mark. Leaves short petioled, opposite, oval or somewhat obovate obtuse, softly pubescent on both sides, very succulent (sometimes fully quarter of an inch thick). Flowers pedicelled, axillary, solitary, moderate sized, varying from nearly white to deep pink: calyx conical, tube externally hairy, lobes triangular acute: petals ovate or suborbicular, corrugately plaited on the margin, deciduous.

I have dedicated this genus to Mr. John McClelland of the Bengal Medical Service; Editor of the Posthumous works of that transcendent Botanist, William Griffith. Though not himself a Botanist, I think the Science owes him a large debt of gratitude, for his disinterested labours, which I here endeavour, in part, to pay, by dedicating a genus to him and associating with his name that of his justly lamented friend.

Macclellandia Griffithiana. (R. W.)

Islands off Tuticoreen, close on the sea beach flowering and also bearing ripe fruit in February—and, judging from the appearance of the trees, apparently in flower at all seasons. In this, in many respects unique plant, I have availed myself of the opportunity of uniting the names of two, so long as both lived, inseparable friends, and trust they may ever remain so associated, by its proving a really hitherto unknown plant and, up to the publication of this sheet, an undefined genus and species.

1997. Hortonia floribunda (R. W.), arboreous, leaves opposite, exstipulate, petioled, oblong lanceolate, acuminate, entire, penninerved: cymes peduncled, axillary, longer than the petiols: exterior leaves of the involucrum (apparent sepals), pedicels, and young shoots minutely stellato-puberulous.

Ceylon in woods, in the vicinity of Pousloway and Rombady, flowering March and April.

1998. Hortonia ovalifolia (R. W.), leaves petioled, oval, obtuse at both ends, coriaceous, glabrous, when dry slightly revolute on the margin: peduncles axillary, 1- or few-flowered, exceeding the petiols: fruit pedicelled, ovate, slightly compressed, glabrous.

Adam's Peak, flowering in March. Gardner, communicated by Mr. Thwaites. This differs from the preceding in the inflorescence and form of the leaves.

1998-2. Hortonia acuminata (R. W.), arboreous: leaves petioled, ovato-lanceolate, acuminate, entire, glabrous: peduncles axillary, exceeding the petiols, few-flowered.

Ceylon, Colonel Walker. This, as regards foliage, greatly resembles *H. floribunda*, but the inflorescence and flowers, so far as my solitary specimen enables me to judge, is very different.

1999. Calysaccion longifolium (R. W., Ill. Ind. Bot. I. 130), arboreous, monoicous or dioicous: young shoots obsoletely 4-sided: leaves opposite, short petioled, linear lanceolate, obtuse, coriaceous, costate, but without lateral parallel veins: flowers numerous, fascicled on axillary tubercles: fascicles dense, many-flowered, flowers short pedicelled.

Malabar, indigenous; Bangalore, introduced; Northern Circars, possibly also introduced—and in that climate monoicous or becoming hermaphrodite.

The plants I saw at Bangalore were all covered with fruit, hence I presume, like those from the Circars, and others I heard of introduced, I think, in Combaconum, becoming, under the modifying circumstances of change of climate, bisexual. Those from which the original character was taken and those now figured were from the Malabar Coast, and in both instances dioicous.

" A large tree, leaves opposite, oblong; flowers in March and April in clusters on the thick branches below the leaves; small, white, streaked with red, diæcious. The male tree is called *Woondy*, the female *Poonay*, both are also known by the name of *Suringel* or *Gardeoondy*." Hab. "Parell and Woorlee Hills, Bombay, Kennery jungles in considerable abundance. On the Ghauts and throughout the Concans.

The flowers are collected and exported to Bengal for dying silk." Graham's catal. Bombay Plants, p. 73.

2000. Centunculus tenellus (Duby in D. C. Prod. v. 8, p. 72), small erect, branched from the base or simple, branches erect: leaves broad ovate, acutish, entire, subsessile, or narrowing into a petiol: flowers axillary, peduncles shorter than the leaves: segments of the calyx linear lanceolate, subulately acuminate, as long as the corolla: corolla deciduous, pitcher-shaped at the base: capsule as long as the calyx.

Neilgherries, Rev. Dr. Schmid.

I am indebted to the Rev. Dr. Schmid for the specimens of this very rare plant from which the drawings were made. He found them, I think, on the grassy steep slopes behind Dawson's Hotel, along with some most minute forms (probably a new species) of Hedyotis. I am also indebted to the same acute observer for specimens of an Erodium, apparently new, but on that point the specimens are scarcely

sufficiently perfect to enable me to decide. This species of *Centunculus* was originally found in Nepaul, its rediscovery on the Neilgherries adds another to the many already existing links which connect these distant floras.

2000. Primula denticulata ? (Smith, Ex. Bot.), leaves rugous, thin, glabrous, ovato-lanceolate, unequally denticulate, acutish, smooth above, beneath more or less dusted with white farina, sometimes without farina, narrowed into a winged petiol, sheathing and membranous at the base: involucrum many-flowered, leaflets acuminate, the exterior ones broader lanceolate longer than the pedicels, the interior ones linear lanceolate, shorter: calyx urseolate, 5-cleft, divisions linear lanceolate acute, longer than the tube: corolla salver-shaped, lobes obcordate, obtuse. Duby in D. C. Prod.

The specimens from which the drawing was made were kindly communicated by Captain Munro who gathered them at Hungarung on the Himalayas in August. I am doubtful whether I have correctly named the plant as the specimens differ in some minute particulars from the character, but as they agree in their more prominent features, I could not venture on constituting this a new species, the more so as I have not an opportunity of consulting Smith's figure. Should it prove new, I would suggest its being dedicated to the discoverer. It is introduced here mainly to fill the plate, but also in the hope that, since *Centunculus* has been found on our southern mountains, a *Primula* may be found to bear it company.

Scitamineæ.

This is the Linnean name of a curious, beautiful and useful group of plants, including the Plantain, Cardamom, Ginger, Turmeric, Zedoary, Arrowroot, Indian shot (canna), and many others. The original group, which now includes about 300 known species, is divided into three orders—*Musaceæ*, *Zingiberaceæ*, and *Marantaceæ*. The first is distinguished by having several stamens—the second by having one stamen with a perfect 2-celled anther, and the 3d by having 1 stamen with a 1-celled or half anther, and that placed at one side of the flower, usually on a petaloid filament.

Illustrations of each of these orders will be found among the following series of plates. The group, viewed as a whole, is readily distinguished by its foliage and habit. Erect herbaceous stalks with sheathing more or less lanceolate leaves, having a distinct mid rib with the lateral veins diverging thence at more or less acute angles towards the margin. In most other monocotyledonous plants (some exceptions will be mentioned by and by) they run in parallel lines from the base to the apex.

At first sight the flowers of *Zingiberaceæ* seem, as in orchids, to consist of a six-lobed perianth, 3 exterior and 3 interior, one of the latter more or less differing from the others, forming, as in orchids, a lip opposite the stamen. This is not, however, their true structure, for they have in addition to this coroloid perianth, a distinct calyx, (usually much shorter and embracing its tubular base) which is wanting in orchids. The difference is explained by assuming that in this group there are six stamens, 5 of which are modified, and only three in orchids, two of which are modified or wanting. That such is really the case is shown by the Plantain which has a six-parted perianth and six stamens one only of the latter imperfect. In it, the 3 larger exterior lobes of the perianth correspond to the calyx of the Gingers, the 3 smaller interior to the exterior lobes of the perianth, while the 3 outer stamens represent the inner perianth and the 3 inner the staminal series of Gingers. According to this view, the flower of *Zingiberaceæ* consists, 1st of the calyx, 2d of the exterior or calycine lobes of the perianth, 3d, of the interior, or petaloid lobes, *modified stamens*, and 4th, of the proper stamens, two of which are abortive, and the third, or odd one, placed opposite the lip, perfect. *Marantaceæ* differ from this arrangement in perfecting one of the lateral stamens in place of the odd or posterior one.

In the discrimination of the genera of *Zingiberaceæ* the anther is usually looked to as furnishing the essential characters, but of course the other parts of the flower are not overlooked. The first point to be noticed in examining one of these plants is to ascertain whether or not the filament extends beyond the anther. If it has not a crest or prolongation it is referable to *Hedychium*, *Alpinia*, *Globba*, *Roscoea* or *Gastrochilus*, all of which have crestless anthers, but are easily distinguished by other marks. The lateral appendages of the anthers of some of the Globbas do not come under that denomination.

Of those that have it prolonged, *Zingiber* has an awl-shaped point. *Elatteria*, a short more or less fleshy thickening of the point. *Costus*, a short membranous prolongation. *Curcuma*, a dilated point and two spurs at the base. *Kæmpferia*, a long membranous forked point. *Monolophus*, a short broad reflexed point. *Roscoea* has the base of the anther prolonged.

These brief indications of the essential characters of the genera, so far as they are derived from the anther, will suffice to show that it is not generally difficult to distinguish the genera of this order with fresh plants in hand; and that, even with dried specimens if the flowers are not much injured in the drying, but a moderate degree of skill is required to open, for examination, flowers previously softened by immersion for a few minutes in hot water.

The genera of *Marantaceæ* are easily known by their habit.

As it is probable my figures will generally be examined in comparison with fresh plants with which in minute particulars they may not at all times be found to correspond, it is proper to mention that several of them are taken from dried specimens, and that in such cases minute accuracy of outline is not always attainable, even while the likeness is so well preserved as to leave no doubt as to the identity of the object represented. This remark is more especially applicable to the magnified dissected flowers which, it must be allowed, it is often difficult so far to restore as to admit of the representation conveying a correct idea of the aspect of the parts, as seen in the growing plant, but I trust that are generally so well done as to leave no doubt of the species to which they refer and which they are intended to make known.

2001. Globba marantinoides (R. W., *G. marantina*, R. W. Icon., non Willd.), leaves petioled, lanceolate: spike terminal, distichous, lower bracts bulbiferous; upper floriferous: flowers 2-4 in each bract: lip entire, truncated at the apex, reflexed.

Anamallay, in dense alpine forest, very abundant, flowering in August and September.

When naming this plant, rather hurriedly, I fear, I at once referred it to *Marantina*, not duly bearing in mind its petioled leaves, its several- not *one*-flowered bracts, and its undivided lip—to which I might have added geographical position, the true *G. Marantina* being an Eastern species, from the Moluccas, while this is from the interior of Continental India. It is certainly, judging from description only, very like the other, and may possibly be the *G. bulbifera*, Roxb., but of it, the description is so imperfect that I am unable to identify the two plants, and therefore think it better to keep them distinct.

Considering the importance attached to modifications of the anther in this family, this seems, with its congeners, well entitled to form the type of a genus. As compared with the following, a true *Globba*, these differences are most conspicuous; and, added to the habit observed in all three, of forming tubers in place of flowers in the lower bracts of the spike afford strong grounds for separation. At a very early stage of Roxburgh's career he seems to have been of this opinion and apparently sent Home specimens of his *G. bulbifera* under the name of *Colebrookia*, an undefined name long ago published by Mr. James Donn in his Cambridge Catalogue, but never taken up and since superseded by Roxb. and Smith's *Colebrookia*, a genus of Labiateæ.

2002. Globba ophioglossa (R. W.), leaves short petioled, acuminate, glabrous; panicles terminal: lip linear pointed, deeply cleft; interior lobes (petals) linear lanceolate: capsule globose, smooth.

Malabar, Anamallay Hills, &c.

This though, in appearance, like *G. orixensis* and *Careyana* is, I believe, quite distinct from both. I have named it with reference to its long deeply two-cleft lip, a character of some value when added to the naked anther. The leaves are perfectly glabrous on both sides. The perianth in both this and the preceding is thickly dotted with red, resinous, shining translucent points. It has no trace of exterior bracts and tubers, similar to the preceding, and as regards inflorescence, so different that it may well be placed in different genera.

2003. Zingiber zerumbet (J. E. Smith), stems declinate, leaves sessile lanceolar: spike long peduncled, oval, compact, obtuse: bracts broad obovate obtuse, margins coloured: lip 3-lobed. Roxb. Fl. Ind. 1. 47.

Anamallay Hills, in dense forests, frequent, flowering during the rainy season, August and September.

This is an extensively diffused species. Roxburgh assigns the woods about Calcutta as its Bengal station; in the Southern forests, I fancy it extends nearly as far south as Cape Comorin. The head of flowers is supported on a stalk springing direct from the root, from 2 to 3 feet long, sheathed, its whole length, in scariose rudimentary leaves, and along side of it grows the proper leaf-bearing stalk. This, therefore, is as much a root flowering species as the next, the length of the peduncle being the only difference.

2004. Zingiber squarrosum (Roxb.), leaves lanceolar: spikes squarrose, half immersed in the earth: bracts linear, with a long waved tapering point: lip 3-lobed, apex bifid.

Abundant in the Anamallay forests, also on Bolamputty Hills near Coimbatore, flowering from July to November.

This is a large species forming by its underground progression large patches. In favourable spots the stems attain a height of from 4 to 6 or even 8 feet. The spikes seem to continue enlarging indefinitely all the growing season as I have seen many that measured at least a foot in diameter. They ripen their seed abundantly and when mature, and the capsules burst, showing the numerous seed, each clothed with a large pure white saccate arillus, and the deep crimson of the inner surface of the capsule, they form a beautiful object. When the drawing was made they were not so far advanced, and when sent to the lithographer the deficiency could not be supplied.

2005. Curcuma aromatica (Salisb. C. Zedoaria, Roxb.), bulbs small and, with the long palmate tubers, inwardly yellow: leaves broad lanceolar, sessile on their sheaths, sericeous underneath: except the spike, the whole plant of a uniform green. Roxb.

Malabar, frequent, flowering from April or May until August or September.

This plant very generally agrees with Roxburgh's description, even down to minute particulars, still I do not feel certain that it actually is his species. If, however, it is not, it is so near that actual comparison of specimens must determine the differences. The bracts of the spike are pale green below, gradually passing into deeper pink until the last are almost crimson. The outer perianth is pink, and inner and lip yellow.

The genus *Curcuma*, so far as regards the determination of species, is rather difficult, but to distinguish a Curcuma from any other genus of the order is easy after any one of its species is known. The peculiar formation of the spike, and very characteristic bracteal sacks which are common to all, proclaim at a glance the genus. I make this remark under this species, because it is better shown here than in the other, but the difference is in the drawing not in nature, for with the plant in hand there is no mistaking the genus though, as respects the species, it may still be a question whether I have judged rightly, in making it a new species. One very objectionable set of specific characters has been had recourse to for distinguishing the species, those, namely, taken from the roots. To my mind, such characters are objectionable as being parts beyond the reach of observation in the growing plant, and as not being preservable in the dried one. The habit and foliage is certainly much alike in all the species, but doubtless, if carefully studied, the bracts and flowers would be found to furnish better ones, and not liable to the above objections. Neither having roots nor growing plants before me, I find it most difficult to indicate characters by which the following species can be distinguished from the 20 others of the genus, though, so far as I can detect, it does not accord with any of them.

2006. Curcuma Neilgherrensis (R. W.), bulbs? leaves scarcely petioled, lanceolate, somewhat cuspidate, glabrous: spikes scarcely rising above the ground, compact: limb of the bracts prolonged, sublanceolate, obtuse, longer than the flowers, reflexed: outer lobes of the perianth linear cuspidate, inner

ones obovato-lanceolate, obtuse: lip broad, suborbicular, bidentate at the apex: anther spurs short: capsule globose, glabrous, crowned with the withered remains of the flower.

Neilgherries, very abundant on the S. Western slopes about Neddawuttim, flowering during the spring months, before the leaves appear, but continuing in flower long after they are full grown.

This is a small species, the largest leaves scarcely exceeding a span or 12 inches long. The terminal tuft of the spike is very full, of a deep pink, while the lower bracts are at first pale yellowish, changing to greenish. Flowers, especially the lip, deep yellow, the lateral lobes more membranous and paler.

2007. Elettaria cannœcarpa (R. W.), sarmentose, underground shoots bearing the spikes: leaves lanceolate, acutely acuminate, glabrous: floriferous stems clothed with sheathing scariose leaves, at length ascending, spikes short ovate: bracts lanceolate, red: perianth hairy on the throat and lip: outer lobes obovate, lanceolate, sub-cuspidate, inner reduced to 2 subulate teeth or spurs; lip oval, bicuspidate: filament produced beyond the anther: capsule globose, echinate all over.

Huliculdroog, Neilgherries, in dense forest, flowering May.

Stems 4–6 feet high, procumbent and rooting at the base, afterwards ascending, the procumbent portion giving off the spikes which scarcely rise above ground, spikes oblong oval, bracts deep pink at the apex, paler below, perianth yellow, fruit dark brownish purple, beset all over with soft prikles resembling those of a canna. This species seems very distinct from the others—when recent it exhales an aromatic odour.

2008–9. Hedychium flavescens (Roscoe), leaves lanceolate acuminate, villous beneath, the acumen withering: spike capitate, imbricate: exterior bracts broad, obtuse, ciliate at the apex; the interior ones cylindrical, 2–3-flowered: lip broad, 2-lobed, as long as the filament.

Neilgherries, frequent, in low swampy ground. In sheltered situations where the fine foliage and handsome heads of flowers are not injured by high winds, this is a very handsome plant, and, owing to the flowers opening in succession, continues long in flower. It seems very rarely to produce seed. I do not recollect ever having seen its fruit. The flowers are pale yellow, afterwards deepening a little, but seldom deeper than straw colour.

2010. Hedychium coronarium (Willd.), leaves lanceolate, pubescent beneath: spike capitate, imbricate: bracts broad ovate, acute: lip orbicular, bifid at the apex, longer than the filament.

Neilgherries, Kotergherry Ghauts, at an elevation of about 4000 feet, very abundant, forming large patches in moist almost marshy soil. Very like the preceding from which it is most readily distinguished by the form of the bracts, and the interior or petaloid lobes of the perianth which are very different. Flowers pure white, fragrant.

2011. Hedychium cernuum (R. W.), leaves short petioled, long lanceolate, acutely acuminate: spike cernuous, loose: bracts narrow, obtuse; lobes of the perianth narrow linear, longer than the stamen: lip lanceolate, bifid at the apex: capsule globose, hairy: seed involute in a large loose membranous arillus.

Neilgherries, Burlear, on the Eastern slopes, on the banks of a stream, rare. The fruit when mature are of a dark reddish or deep orange colour. This seems to be a rare plant, but the locality mentioned is not the only one where I have found it, but the others are not noted.

2012. Hedychium venustum (R. W.), leaves long petioled, lanceolate, acute: spike drooping, lax; bracts linear, obtuse, margined: lobes of the perianth narrow, exterior somewhat lanceolate, interior linear: all longer than the stamen, lip deeply cleft, lobes lanceolate.

This figure is taken from a dried specimen, the station of which is not recorded, but I think Coorg.

It is evidently nearly allied to the preceding, but is obviously quite distinct as shown by the long petioled leaves and deeply cleft lip.

2013. Roscoea alpina (Royle), flowers few, peduncled, infolded in the sheaths of the leaves: calyx obliquely truncated, bidentate at the apex: the upper exterior segment of the corolla broad, somewhat vaulted: capsule linear. R.

Simla. Masoori. I am indebted to Mr. Edgeworth for the drawing from which the figure was taken, and to the late Countess Dalhousie for specimens of the plant, from which the dissections were partly prepared and all verified. The character is copied from Dr. Royle's Illustrations.

2013–2. Roscoea lutea (Royle), raceme spike-like, straight, exserted: flowers few: calyx obliquely truncate, obtuse, 3-toothed: capsule berry-like, roundish. R.

I am indebted for the specimens from which the drawing was made, to the late Countess Dalhousie, aided by a drawing from the pencil of Mr. Edgeworth, but which did not seem to me to give a good idea of the plant in my possession which is more in accordance with that of Dr. Royle. These two species are introduced simply as illustrations of the genus which, though not hitherto found so far South, may yet be so. When the drawings were made I had overlooked the circumstance of both plants being already figured by Dr. Royle, otherwise I think I should not have introduced them here, even with original drawings.

2014. Costus speciosus (Smith), leaves subsessile, oval, short acuminate, villous beneath: sheaths fringed: spike oval: lip undulated, entire: filament, pubescent on the back.

Anamally, Bolamputty Hills: also in the forests about Palghaut, &c. In a word it is a rather common and certainly a very conspicuous plant, long retaining its beauty, being as attractive by its deep red heads of fruit, as by its handsome flowers, rarely more than two or three of which are open at the same time.

Costus Nepaulensis so much resembles this species that it seems to me they might easily be mistaken for each other, even when placed side by side.

2015. Maranta virgata (Wall., *Phrynium virgatum*, Roxb.), stems simple, jointed, and knotted at

E

the joints: leaves distichous, lanceolate: panicles terminal, loose, branches filiform: flowers scattered, paired, small, fruit hairy.

Courtallum, Malabar, Bolumputty, &c. This species is nearly allied to the *Maranta arundinacea*, or West Indian Arrowroot, but is not, I have heard, used in this country for the preparation of that farina.

On the Malabar Coast where most of the Indian Arrowroot is prepared, I am told a variety of species, not of this order, but of the *Zingiberaceæ*, are used, *Curcuma*, *Costus*, *Zingiber*, and *Alpinia*, all being laid under contribution to supply the raw material, *Maranta* being rejected on account of the woodiness of the roots, rendering them at the same time difficult to work and unproductive.

2016. Phrynium capitatum (Willd.), leaves radical, long petioled, ovate oblong: heads of flowers petiolary and terminal, glomerate: bracts truncato-incurved. Roxb. Fl. In.

Malabar.

I only know this plant from description and dried specimens, never, so far as I recollect, having met with it growing. It and one or two others belonging to the genus, present forms very unusual in this order. In Rushes and Pontederea we have floriferous petiols, but so little was such anticipated by Linnæus among his Scitamineæ that he, judging, I presume, from Rheede's figure only, referred this plant to Pontederea and described it under the name of *P. ovata*, quoting Rheede's figure as his authority for the plant. I am not at all clear on the point of its bearing petiolar inflorescence as described by Roxburgh. The petiol, it seems to me, commences at the joint, and all below seems peduncle rather than petiol. I infer from Roxburgh's description that there are two forms of leaves, the first truly radical without flowers or joint, the other, a long peduncle bearing on its apex a tuft of flowers and a leaf, or, perhaps, it might more correctly be called a modified spadix and spathe.

If this view be found correct, it will indicate an analogy if not an affinity between this genus and Juncus, and through them, between the two families.

2017–18. Musa superba (Roxb.), stem short, conical, thickly covered with the spongy petiols of decayed not sheathing leaves: leaves petioled, linear, rounded at both ends, cuspidate: spadix drooping: spathes broad, oblong, obtuse, subcordate at the base, many flowered, hermaphrodite ones persistent.

Anamallay Hills, generally in clumps in crevices of rocks, often almost inaccessible, very rarely flowering or producing fruit. The drawing, all except figures 2 and 3, which were from a wild specimen, were taken from a plant introduced into a garden here. The remains of the leaves with which the stem is clothed are compressible, but not properly soft. A sort of corky feel, but when cut into are found composed of large cells, the coriaceous walls of which cause the resistance experienced on pressing. Their thickness, towards the base or point of attachment, is about three or four inches. It is, as seen growing among its native rocks, a handsome plant not so as seen in the garden, where, owing to exposure, it had become very much torn and ragged. Roxburgh says he received the plants he describes from the Dindigul range of hills. It may therefore be as well to add that the Anamallay Hills form part of the same range. The Iyamallay and Bolamputty Hills form another group of hills near Coimbatore on which this plant is also indigenous. The cluster of young fruit, fig. 1, is, for want of room, reduced in size.

2019–20. Crinum latifolium (Linn.), bulb globose, stemless: leaves glabrous, lanceolate, waved, tapering to the point, bluntish, rough on the margins: scape erect, many-flowered (10–15): flowers sessile, declinate with an obliquely campanulate border: fruit a fleshy tuber with imperfect seed.

Coimbatore district, not unfrequent in cultivated ground or under the shelter of hedges, flowering during rainy weather, most freely during the autumnal months. It is, when in full flower, a very handsome plant, but is seldom seen in that state unless cut over night before the flowers open, they being so subject to attacks of insects that of a rich cluster looked at, and pronounced most beautiful by moon light, the evening before, the fragments only are found next morning. When the scape is cut and immersed in a bottle of water they open equally well, and then they will endure a couple of days and are most beautiful. The foliage of the plant figured is not in proportion to the flower, but that for want of room was considered an advantage when selecting the specimen for representation.

2021–22. Crinum toxicarium (Roxb.), "Caulescent: leaves sparce, lanceolar: flowers pedicelled, numerous (even as far as 60 in a hemispheric umbel): capsules with one or two bulliform seeds." Roxb.

Coimbatore, not unfrequent in low lying rich soil, usually flowering on every recurrence of wet weather. Like the preceding, it furnishes savoury food to certain insects, for, opening its flowers after sun set, they are generally devoured before sun rise. The leaf represented is smaller than the original which was about 3 feet long and over 6 inches broad. In place of forming seed, the fruitful ovaries become converted into tubers which grow when planted, but so far as I have ever seen it ripens no seed.

2023. Pancratium verecundum (Soland), spathe 4–8-flowered: leaves linear acute: limb of the corolla shorter than the tube: divisions of the crown alternately deeper, stamens incurved, two or three times longer than the segments of the crown.

Coimbatore, not unfrequent near hedges where the soil is rich and light, flowers most freely during the autumnal rains, but is generally to be met with in flower during rainy weather. The flowers are pure white, the leaves linear, radiating all round and curved back causing their tips to rest on the ground. It is pretty, but, like the two former, very fugacious, the flowers opening after sun set and usually before morning they are consumed, if not saved by being cut and made to blow out of the reach of their enemies.

2024. Agave vivipera (Linn.), stemless, leaves all radical, dentate: scape panicled: tube of the corolla contracted in the middle: stamens equaling or somewhat exceeding the lobes of the perianth.

This is an introduced and naturalized plant, and on that ground is scarcely entitled to a place in a work on Indian Botany. I have, however, in this and the following instance departed from that rule, as affording examples of an interesting metamorphosis by which the flower buds become converted

into tubers and leaves capable of reproducing the plant, and further for the purpose of informing many persons in India, who take an interest in such inquiries, that they are American not Asiatic plants. The plant from which the accompanying figure was taken grew at Palamcottah. It may perhaps be noticed, with surprise by some, that this is said to be stemless notwithstanding its gigantic stem of some 20 or 30 feet high. The stem in this case, however, is not a true stem, but a scape or flower stalk, terminating in a large panicle of flowers and viviperous buds. It is in truth the same in kind, only much larger, as the flower stalks of the preceding *Crinums.* Wildenow calls it a branched scape. I have taken the liberty of altering the expression and called it a panicled one, in contradistinction to a spiked and racemed one, which it actually is. The *Agave Americana*, or as it is usually called, American Aloe, now so common all over the country, belongs to the same genus, and, as the name imports, comes from the same country. They are not aloes. Rumphius has introduced a figure of this plant into his Herb. Amboynensis, apparently, on the supposition of its being indigenous in that island.

2025. Fourcroya gigantea (Ventenat), stemless: leaves entire: scape panicled.

This, as remarked above, is also an introduced plant common about Bangalore and Seringapatam as a hedge row plant. It is distinguished generically from the other by its perianth, the filaments being dilated at the base, the large fleshy protuberance at the base of the style and crowning the ovary, and by the fringed stigma. Like the preceding it is also viviperous. The drawing was taken from plants growing at Bangalore.

2026. Alpinia Rheedii (R. W., Rheede Hort. Mal. 11. tab. 14), leaves sub-sessile from broad lanceolate obtuse to lanceolate, cuspidate: panicle terminal, erect, many-flowered: outer series linear, obtuse, somewhat concave, lip unguiculate, sub-orbicular, 2-lobed claw with two dilatations at the base (lateral lobes of the inner perianth) each terminating in a subulate point, capsules globose, slightly downy.

Malabar, Courtallum. Roxburgh quotes Rheede's plate for his Alpinia Allugas, and, judging from his description, except the lip which he does mention as unguiculate, not without reason, but he at the same time quotes Roscoe as his authority for the name. Roscoe's plant, as represented in his Monandrean Scitaminious plants, seems to me totally different from both Rheede's and mine, which quite correspond, hence I am precluded from adopting his name. Such being the case, I have found it necessary to view this as a new species and have given it the name of the original discoverer. One circumstance of note is the character given of the appendages at the base of the claw described by Roxburgh as "two fleshy protuberances near the base." In my plant they are flat, somewhat coriaceous, ascending, and each terminates in an erect subulate tooth, but not well represented in the plate. They are coloured, for even in the dry plant they remain darker—a reddish brown—than the claw to which they belong. I dare say it is scarcely necessary to mention that they are the rudimentary lateral lobes of the inner series of the perianth, which, in this genus and in *Costus*, is reduced to the lip with occasionally two subulate teeth at the base. In Roscoe's plate of *A. Allugas* they are represented as globose fleshy bodies. This, when grown in favourable circumstances, seems to be a very handsome plant, the panicles being large and the flowers very numerous.

2027. Alpinia nutans (Roscoe), leaves lanceolar, short petioled, smooth: racemes compound by the lower pedicels being two or three-flowered, drooping: lip large ovate, cordate, obscurely three-lobed at the base; middle lobe curled on the margin: ovary hairy, oval, 3-celled: ovules attached to the middle of the partitions: capsules globose, sprinkled with short hairs.

The specimen (which at the time happened to be my only available one) taken to convey an idea of this most gorgeous plant is so unfit for the purpose that I was only induced to use it as presenting an unusual form, an erect in place of a drooping raceme—as most conspicuously showing the spathe in which it is at first enclosed; the small leaf at the end often enlarges so much that the spathe portion becomes obscured—and lastly, but principally, because at the time the drawing was made it was virtually the only species of the genus I had, my others having accidentally got mislaid. It does not convey so good an idea of the characters of the species as I could wish, but it was for the sake of illustrating the genus it was used and that it does well, by showing all its characters. Here we see the large common spathe of the whole panicle; at fig. 1, a partial spathe enclosing several flowers, at 2, that opened showing one flower open and an unopened bud. The unopened one encloses in addition to its own flowers another younger bud. The dissected flower, fig. 3, shows the perfect exterior series of the perianth and the lip, but no lateral lobes of the inner series, these are not constant and seem to have been absent in this specimen, as the examination of several flowers gave no sign of their presence, though I have since seen indications in another specimen: it also shows the stamen and style in situ, the anther without appendage of any sort. Fig. 5 shows the ovary with the perfect and rudimentary styles, figures 6 and 7, transverse and vertical sections of the ovary, the former showing the placentæ attached to the middle of the partitions, not to the edges in the axis. Fig. 8 presents a full grown capsule, 9 a seed, 10 the same cut so as to show the position of the embryo and 11–12 two embryos detached showing their very peculiar form; they are flattened, somewhat foliaceous, with the radicle springing from the middle and pointing towards the hilum.

2028. Alpinia calcarata (Roscoe), flowers terminal, spike slightly declined, downy; lip large ovate, crenate, slightly bifid; spurred at the base: leaves narrow lanceolate, unequal-sided. Roscoe.

Shevagherry Hills, flowering August.

The only point in which the figure differs from the character is the undivided lip, and that as shown in Roscoe's plate is sometimes reduced to mere slight emargination, so that I have no doubt of this being the true plant. Fig. 5 represents an unusual form, a *diandrous* flower, the stamens being attached on either edge of the lip. The flower represented was the only one I could find on the specimen.

2029. Kæmpferia rotunda (Willd.), leaves oblong, coloured: spike radical, appearing before the leaves; lateral lobes of the corolla obovato-lanceolate, acute: lip deeply 2-cleft, lobes obovate, very obtuse, crest of the anther linear, forked, with a small tooth between.

Malabar.

The two figures in the accompanying plate may be distinct species, a point I cannot determine with my present materials, but I think it more probable they are but variations of the same. The lip in the nameless one, of which I have a coloured drawing, is a beautiful lilac, tending to plum colour.

2030. Monolophus scaposus (Dalzell, *Hedychium scaposum*, Nimmo in Graham's Catalogue), stemless, root fibrous with small oblong tubers: leaves lanceolate, glabrous, long acuminate; petiol and limb of equal length; scape erect, round, about 2 feet long, sparingly leafy: spike terminal, compact, imbricated, many-flowered: flowers 2–3 to each common bract, each furnished with a smaller partial bract, opening in succession: common bracts lanceolate, shorter than the flowers; flowers long tubular: posterior lobe of the exterior perianth larger than the lateral ones: lip broad ovato-cordate, 2-cleft: anther terminating in a short obtuse crest: ovary 3-celled, placentas axile, capsule 3-celled, seed obovate embraced by a loose lobed aril, embryo axile, curved.

Malabar Coast; Karlee, Nimmo; Malwan, Dalzell.

I am indebted to Dr. Stocks, for my specimen of this plant accompanied by flowers and fruit preserved in spirits for the analysis. It differs in some particulars from Wallich's *Monolophus*, but not sufficiently, it appears to me, to justify its forming the type of a genus. I extract the following very accurate description of the flower, by Mr. Dalzell, from Hooker's Kew Garden Miscellany, vol. 2, page 143.

Calyx tubular, 3-toothed, cleft; teeth obtuse, about equal. Corolla: tube cylindrical, curved, 4–5 times longer than the limb: two anterior exterior petals linear oblong, 5–7-nerved, flat; the posterior one sub-cucullate, mucronate, all reflexed during expansion: interior petals much larger, lip, the largest, broad obtuse, bifid at the apex. Filament very short, about a line long and broad, extended beyond the anther into a short rounded reflexed strap. Stigma funnel-shaped, tubercled on the back.

2031–32. Lilium Neilgherrense (R. W.), erect, leaves sessile, scattered, broad ovato-lanceolate, abruptly acuminate, sub-cuspidate, glabrous: flower hypocrateriform, ascending; tube long, throat campanulate, naked; limb spreading: capsule obtusely 3-angled, 3-sided.—In this species the leaves are about 3 inches long by 1¼ broad, sub-cordate at the base.

Neilgherries, flowering July and August.

2033–34. Lilium tubiflorum (R. W.), leaves scattered, short petioled, narrow lanceolate, tapering to a point, glabrous: flowers ascending, hypocrateriform; tube long, prominently ribbed along the sutures: throat campanulate, limb spreading, lobes somewhat revolute at the apex.—Leaves 4–6 inches long; 6–8 lines broad.

Neilgherries.

2035. Lilium Wallichianum (Ræm. and Schult.), stem slender, leafy, few- or one-flowered at the apex: leaves scattered, numerous, approximated, linear, acuminate, sessile: flowers hypocrateriform, drooping; tube long; throat campanulate, naked, limb spreading.—Leaves 2–3 inches long, scarcely ½ inch broad, lanceolate acute.

Neilgherries. All these species show a predilection for rocky ground especially if kept humid by neighbouring springs. They are very handsome plants and seem to merit more attention, as ornamental objects, than they receive.

Distinct as these three forms appear, I can scarcely expect they will prove, under cultivation, distinct species, but at the same time, with my present information, I do not feel justified in uniting them. In this state of uncertainty, I beg leave to solicit the attention of Mr. McIvor, and any Botanists who may visit the Hills, to the subject. Mr. McIvor may perhaps be able to set the question at rest in a single, or at most two seasons, by raising plants from seed and ascertaining whether those taken from any of the forms run indiscriminately into all, or are constant to their parental form. The same experiments ought to be tried on plants obtained by dividing the roots, and grown under different circumstances.

Anthericum. Bulbine. Phalangium.

In determining the genus to which I should refer the following plants, which, I presume, all belong to one genus, I felt much at a loss how to decide. Authorities are conflicting: and on endeavouring to trace the names back to their origin, I found the obscurity increase in place of diminish. Linnæus, in the first edition of his Genera Plantarum, had two genera—*Bulbine* and *Anthericum*, the former having bearded, the other beardless filaments. These he afterwards united, retaining *Anthericum* as the name of the enlarged genus. Jussieu in his Genera divided the genus into two, retaining *Anthericum* for the species with bearded filaments (the original Linnean Bulbine), and restoring Tournefourt's *Phalangium* for the reception of those with beardless filaments. Since that time, these three genera have been taken up and laid down, apparently at the will of each successive writer, and now there is no end of confusion in the synonyme. The characters, with the exception of the filaments, are so nearly the same in all, that the only question for determination seems to be whether the filaments being beardless or bearded affords a sufficient generic distinction, for if so, then by going back to originals we get at a definite nomenclature. It is now to be regretted that Jussieu, in restoring the original Linnean genera, did not adopt his original names, which would have saved much trouble to his followers, a course the more desirable as at the time he restored the generic name *Phalangium* to Botany, it was already established as a generic name in Zoology, a circumstance I overlooked when, following Kunth, I adopted the Jussieuan name in preference to the complex Linnean one. But for this oversight I should undoubtedly have fallen back on the nomenclature of the 1st edition of Linnæus' Genera Plantarum, adopting *Bulbine* for those species with bearded filaments, and *Anthericum* for the following ones which have them beardless; for I consider these characters which are very constant, as of sufficient value to divide the group of species, associated under the latest Linnean *Anthericum*, into two good genera. Linnæus' generic character of Anthericum, in the later editions of his Genera and Species Plan-

tarum, was, "Cal. 0, corl. 6 petals, spreading, oblong, obtuse. Stamens: six, filaments subulate, erect: anthers small, incumbent, 4-furrowed. Pistil, germen obsoletely 3-cornered: style simple: stigma obtuse, 3-cornered. Fruit an ovate, glabrous, 3-furrowed, 3-celled, 3-valved, capsule. Seed numerous, angular." Under this character he and others have placed several species which have since been removed to other genera. In Kunth's Enumeratio Plantarum, the name *Anthericum* appears as a synonym under some 5 or 6 distinct genera. But the genuine species are ranged under two, *Bulbine* and *Phalangium*, those with bearded anthers being referred to the former, those with beardless ones (of which all the following are examples) to the latter. The following is Kunth's character of Phalangium, somewhat abridged; "Calyx, 6 sepals corollaceous, persistent; the 3 exterior ones spreading, the interior ones sometimes broader. Stamens 6: filaments filiform, beardless: anthers 2-celled, introrse, attached about the middle of the back. Ovary sessile, 3-celled: ovules in a double series horizontal, anatropous: style filiform: stigma thickish. Capsule 3-celled, 3-cornered, 3-valved, valves septiferous. Seeds few in each cell, angled, black, shining, subscrobiculate; testa crustaceous, fragile: embryo axile, curved, nearly as long as the albumen, radicle next the hilum.—Herbs, with fascicled roots, scapiform, simple or somewhat branched stems: leaves membranaceous, sheathing: flowers pedicelled; pedicels bracteate, jointed above the base.

From a comparison of these characters with the subjects figured in the 4 following plates it will be seen that, however different in general aspect, they all agree in the particulars noted in the written character, even the last, though so unlike the others, agrees in these particulars. I could have given figures of several other species but thought these enough to illustrate the genus.

2036. Phalangium tuberosum (Kunth, *Anthericum tuberosum*, Roxb.), roots numerous, fleshy, each terminating in an oblong tuber: leaves radical, sword-shaped, undulated on the margin: scape round, naked, flowers panicled: ovary oblong, ovules numerous, style ascending. Flowers white.

A common plant in turfy soil, flowering during rainy weather in both spring and autumn.

2037. Phalangium attenuatum (R. W.), roots fleshy, not (or rarely) tuberous: leaves all radical, sword-shaped, scarcely waved on the margin, long attenuated towards the point, membranous: scape round, naked, racemose, longer than the leaves: flowers numerous, 3–4 aggregated in the axils of the scariose bracts: ovary somewhat ovate, ovules numerous, style straight. Flowers white.

Coimbatore, in cultivated and waste grounds and by hedge-rows, &c., flowering during rainy weather. This is nearly allied to the preceding, but quite distinct.

2038. Phalangium? oligospermum (R. W.), roots fleshy, tuberous: leaves radical, oblong lanceolate, waved on the margin, acute: scape terete, erect, branched: branches racemose: ovary subglobose 3-celled, with 2 superposed ovules in each cell: style declining: capsule 3-celled, 3-seeded: seed globose, rough.

Coimbatore, flowering July and August, flowers white.

I have added a mark of doubt to the generic name on account of the few-ovuled ovaries and the position of the ovules, superposed, not collateral. I doubt whether the difference is sufficient to justify its removal from the genus.

2039. Phalangium? parviflorum (R. W.), roots numerous, fleshy, not tuberous: leaves linear lanceolate, tapering towards the point: scapes several, axillary, slender, ascending, loosely flexuose: flowers small, 3–4 aggregated in the axils of the somewhat remote bracts, short pedicelled: ovary 3-celled; with 2 superposed ovules in each: style simple: capsule 3-celled; cells 1-seeded: seed somewhat globose, concavely umbilicate below, rough: embryo curved.

This is a common plant which I have gathered in Coimbatore and many other localities. As in the preceding I have attached a mark of doubt to the generic name, and perhaps with better reason, leaving the question to be solved at some future time.

2040. Ledebouria hyacinthina. (Roth.)

Common on the sea coast and also often met with far inland. I have specimens collected in Coimbatore.

This is a small herbaceous bulbous rooted plant with linear rather obtuse spreading leaves, the tips when they touch the ground readily rooting, usually mottled with brown spots. Scapes one or two, erect, racemosely many-flowered towards the apex: flowers greenish with a tinge of purple, six-parted, lobes persistent, withering. Stamens 6 as long as the lobes of the perianth. Ovary 3-celled, 2 collateral ovules in each, pendulous from the middle of the cell: capsule 3-celled, 3-valved, 3-seeded. Seed globose: embryo rather large, enclosed in a copious albumen, radicle inferior.—The drawing was made from a dried specimen and does not show the leaves as seen in the growing plant, that is spreading all round with the tips curved towards the ground.

2041. Barnardia Indica (R. W.), leaves lanceolate, channeled towards the base, sub-acuminate at the point, strongly nerved: scape terete, racemose, longer than the leaves: flowers cernuous, afterwards drooping: stamens as long as the perianth, filaments dilated and shortly monodelphous at the base.

Neilgherries, Western slopes near Nedawuttim, also Nagpore, Jerdon.

This plant I have not seen growing. The drawing was taken from living specimens communicated by Mr. Jerdon, flowering in May. He has since then sent me others from Nagpore.

Hypoxidiæ.

Of two genera referred to this order, *Curculigo* and *Hypoxis*, one is said to have the fruit baccate, the other capsular as their essential distinguishing marks. These characters, as regards the Indian species, I have not found sufficient to distinguish them, the fruit, at least in the dried plants, being the same in both, namely, an indehescent membranous capsule. I have therefore adopted another of more easy and certain application in practice. In *Hypoxis* the limb of the calyx rests immediately on the ovary without any intervening tube; in *Curculigo* a long slender tube intervenes between them. In *Hypoxis* the stigma is

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entire, more or less capitate, in *Curculigo* it is conspicuously three-lobed. Making use of these characters I have found no difficulty, with one exception, in referring the following plants to their respective genera. The exception alluded to is *Curculigo Sumatrana.* In it the tube of the perianth is shorter than in the others, and the stigma is somewhat capitate, not lobed, as in the genuine species of the genus. Adding the dense capitate inflorescence to these, I am led to anticipate that this species will ultimately be removed, to form the type of an intermediate genus having the perianth of *Curculigo*, but much abbreviated, and the stigma of *Hypoxis*. The fruit and seed of all are so much alike that I do not think distinctive characters can be obtained from these organs.

A glance at the analysis of the following plates will explain my meaning by showing that the ovary of *Curculigo* is sessile in the axil of the bract, surmounted by a tube and flower, while in *Hypoxis* it is pedicelled with the flower on its apex. The seed in both is oval, round at both ends, furrowed longitudinally, with a lateral very conspicuous attachment. The testa is bright, shining black, and fragile under the knife.

2042. Curculigo sumatrana (Roxb., Loddiges), leaves long petioled, broad lanceolate narrowed at both ends, glabrous, plicately nerved: scape short, compact, cone-like: bracts ovato-lanceolate, about the length, or somewhat longer than the flowers, perianth wheel-shaped.

Malacca, Griffith.

Roxburgh is the original authority for the specific name and it was, I believe, from him that Loddiges obtained it, and it would appear, was the first, owing to the delay in the publication of the Roxburgian manuscripts, to publish it, whence, in Ræmer and Schultes' Systema Vegetabilium, he is quoted as the authority for the name.

Roxburgh quotes Rump. 6 tab. 53 for this plant, a very good figure of it.

2043. Curculigo malabarica (R. W.), leaves long petioled, linear lanceolate tapering at both ends, glabrous: scape, racemose, the lower flowers only hermaphrodite: all clothed with long soft pubescence: bracts ovate, tapering from the base, subulate, pointed: anthers deeply sagittate, stigma large, 3-lobed.

Quilon, Malabar.

Roxburgh quotes Rheede Hort. Mal. 12–59, as "good" for his *C. orchioides.* I was in hopes that it might turn out this species, but on referring to it, I found it represented a different plant and not in flower.

2043. Curculigo brevifolia? (Aiton, Hort. Kew), leaves sessile or short petioled, narrow linear lanceolate, sprinkled with long soft hairs: scape short; lower flowers only hermaphrodite; tube long slender, pubescent: bracts ovate, lanceolate and with the perianth clothed with long lax hairs: lobes of the limb of the perianth, lanceolate: stigma deeply three-lobed.

Neilgherries, Anamally Hills, &c.

A small low growing plant, the bright yellow flowers scarcely rising above the surface of the ground. Root perennial, somewhat fusiform. The drawing of this species was taken from the fresh plant, hence perhaps the flowers may appear large in proportion to the size of the plant as compared with those of the others, which, being taken from dried ones, probably smaller than they should be.

2044. Hypoxis latifolia (R. W., *Curculigo latifolia?* Moon), leaves long petioled, lanceolate, acute at both ends, glabrous, or sparingly sprinkled with hairs; scapes axillary, short peduncled, racemose; lower flowers longer pedicelled, hermaphrodite; upper ones male: bracts about the length of the pedicels, somewhat stem-clasping at the base, subulate pointed: sepals lanceolate acute, sparingly hairy on the back: style about the length of the stamens; stigma slightly 3-winged: capsule oblong, claviform.

Ceylon, flowering in March. Mr. Moon quotes for his *Curculigo latifolia*, Rump. 6 tab. 53, a plant very like this, but which is a true Curculigo, I therefore infer this to be the plant he meant, but referred it to a wrong genus. On this supposition I quote his name as a synonym to mine. He gives Colombo as the station. I do not know where I picked up my specimens.

2045. Hypoxis leptostachya (R. W.), leaves long petioled, lanceolate, acute at both ends, glabrous above, sprinkled with longish lax hairs beneath: scapes short, slender, corymbose, lower flowers hermaphrodite, pedicels filiform, and, with the ovary and exterior sepals, hairy: sepals sub-obovate obtuse: capsules few-seeded.

Malabar, flowering in June.

The inflorescence in this species forms a perfect corymb, the pedicels which are very slender progressively lengthening as they descend on the scape.

2045. Hypoxis trichocarpa (R. W.), leaves long petioled, lanceolate, acute at both ends, glabrous above, laxly pilose beneath: scapes racemose and with the pedicels and ovary densely covered with long coarse brownish hairs: sepals ovate lanceolate, hairy on the back.

Malabar? The station is not stated, but I believe it is Malabar. This, though like the preceding, is easily distinguished by the inflorescence which is more compact, stouter in all its parts, and thickly covered with long coarse shaggy hair.

2046. Hypoxis pauciflora (R. W., *Curculigo pauciflora?* Moon), leaves longish petioled, narrow lanceolate, acute at both ends, glabrous, or sparingly sprinkled with short hairs: scape sparingly hairy, few-flowered: hermaphrodite flowers long pedicelled; male ones shorter, slender, stipules narrow subulate: sepals ovate lanceolate acute, scarcely exceeding the stamens, glabrous, or very sparingly hairy on the back.

Ceylon. There is no character to Moon's plant, hence I merely conjecture that this may be his from the paucity of flowers.

2046. Hypoxis brachystachya (R. W.), leaves (comparatively) short petioled, ovato-lanceolate, acuminate, sprinkled along the sides of the nerves with small tufts of short bristly hairs: scapes short and with the pedicels and ovary, coarsely hairy: bracts, minute, subulate: calyx lobes ovato-lanceolate acute exceeding the stamens, coarsely hairy on the back.

Ceylon. This is at once distinguished from all the others by its shorter petals, thicker more coriaceous leaves, and the very distinct character of the hairs. They are certainly all nearly allied species.

There are still two Peninsular species in my collection, one from Mysore, apparently *H. minor*, but the specimen is too imperfect for discrimination, the other nearly allied to *H. trichostachya*, but differs in having longer racemes and nearly glabrous ovaries.

GLORIOSA. (Lin.) METHONICA. (Juss.)

The respective claims of these two names to be retained to designate this "vere gloriosus flos" has been a subject of controversy among Botanists since the publication of Jussieu's Genera Plantarum in 1791. In 1737 Linnæus published the first, in 1792 Jussieu the second of these names, assigning, so far as shown by his book, no reason for the change. He simply wrote the words, "Methonica, *Gloriosa*, Lin," as if he had the right to set up and pull down according to his own will. Others, however, inform us that he objected to the prior name because it is an adjective.

When about to name this plate, I determined to satisfy myself, at least, and I hope others as to the true merits of the case, and at the same time contribute my mite towards elucidating the principle of priority in naming objects of natural history and establishing it on a proper basis.

The doctrine of priority has most properly been insisted on as the only rule by which the rights of discovery could be preserved, ever since the publication of the Philosophia Botanica of Linnæus. Taking this then as the point on which the whole argument must turn, it becomes necessary at the outset of the discussion to determine in what priority consists.

Owing to numerous departures from it and the manifest inconvenience resulting, the British Association of Science was induced to take the subject into its serious consideration, and in 1840–41 appointed in the Zoological section a committee to examine and report on the subject. The report was presented and approved of in 1842.

As the following paragraph of that report cannot be too extensively known, as being equally applicable to all branches of Natural History, I shall introduce it here, merely substituting the word "natural-historical" for Zoological, and then proceed to apply the principle it so clearly elucidates to the present controversy.

LAW FOR REGULATING PRIORITY OF NAMES IN NATURAL HISTORY.

"*Names not clearly defined may be changed.* Unless a species or group is intelligibly defined when the name is given, it cannot be recognized by others and the signification of the name is consequently lost. Two things are necessary before a natural historical name can acquire any authority, viz. *definition* and *publication* Definition properly implies a distinct exposition of essential characters, and in all cases we conceive this to be indispensable, though some maintain that a mere enumeration of the component species or even of a single type, is sufficient to authenticate a genus. To constitute publication, nothing short of the insertion of the above particulars in a printed book can be held sufficient." And with regard to MSS. it is added, "they are in all cases liable to create confusion, and it is therefore much to be desired that the practice of using them should be avoided in future." *Extract from Report* 1842 *on Zoological Nomenclature of the Zoological Committee of the British Association for the Advancement of Science.*

Keeping this rule, viz., the absolute necessity of both "definition and publication," to constitute priority in naming objects of Natural History steadily in view, I now turn to Kunth's Enumeratio Plantarum, vol. 4, published 1843, the latest general work on Botany, and at page 275 I find

METHONICA, Herm., Juss., Endlicher, [Meisner] *Gloriosa*, Lin., Gært.

Turning now to Herman for his definition of the genus, on which only he is entitled to claim the paternity of the name, all we find is "Methonica Malabarorum," Methonica of the Malabars. There is no definition, the citation, therefore, in a controversial discussion is, to say the least, inappropriate, being without weight in the argument. In like manner both Endlicher and Meisner quote Herman as the authority for the genus. Jussieu, the real authority for the genus, the name of which only he borrowed from Herman, gave it simply as his own and it is his, as much as if he had invented the name for the occasion. To quote Herman, therefore, as the authority for the genus, he having contributed a name only, is mere special pleading, unworthy of those who have recourse to it, as the matter in dispute is between Jussieu and Linnæus, not between Linnæus and Herman. On turning next to Linnæus' Genera Plantarum and Hort. Cliffortianus, we find a new competitor brought into the field, viz., Tournefourt, a name as celebrated and an authority as high as his own. He there gives his own name, "GLORIOSA," with *Methonica*, Tournef., A. G. 1706, "quoted as a synonym, clearly showing that the name occurs in Tournefourt's works, but not in his *Institutiones*, and, therefore, the genus not taken up and defined, which last would have constituted him (Tournefourt) the authority for the genus and, in that case, Herman would probably never have been heard of, nor would Linnæus have attempted to supersede him in the name. Of course, had Linnæus so willed, he might have adopted Herman's Malabar name and there would have been an end of the matter, but being so vastly delighted with this truly glorious flower, he did not think an unintelligible barbarous name nearly good enough, and, therefore, for once departing from his own excellent rules, gave an adjective designation to the genus. And why not? and having carefully defined and published his name, I ask, who has a right to change it? And I further ask, who or what gave Jussieu the right to constitute himself his preceptor's teacher in the matter of forming his generic names? For myself, I reply, I am unable to answer either question, but hope that Meisner, most unhappily the only survivor of the illustrious trio named above, who retain *Methonica*, may be able to do so, or if not, will at once acknowledge himself in error in setting aside the older name and so bring this needlessly protracted controversy to an end.

When investigating this question I stumbled on a curious blunder on the part of the writer of the article, *Gloriosa*, in Rees' Cyclopædia. He says, "Tournefourt, objecting to the name given by Linnæus, because it is an adjective, called this genus *Methonica*, in which he has been followed by Jussieu, and indeed by all French Botanists," &c.

The error to which I allude is, that of making Tournefourt object to the name. He died in 1708 and Linnæus was born 1707, at which rate the latter must have given the name before he was one year old.

The principle of the rule of priority in fixing the names of objects of natural history seems until of late to have been either much misunderstood or else very capriciously used, as we occasionally find, even among high authorities, grievous departures from it. The late Mr. Don, when writing his Flora Nepalensis seems to have so utterly misunderstood it that we find him in many instances setting aside defined and published names in favour of manuscript ones of presumed older date, and in several instances, apparently acting on the *sic volo sic jubeo* principle, setting aside those of DeCandolle merely because he thought he could give better ones. On the occasion of substituting *Hamiltonia* for Mr. Brown's *Spermadictyon*, he even goes so far as to say, "nomen Spermadictionis nimis auris terribile est servandum," thus constituting himself the censor of what is or is not sufficiently euphonious to be borne by the ears of future Botanists. A most startling presumption.

It must, however, be observed, in justice to Mr. Don, that that was not the primary reason for the name of Hamiltonia superceding Spermadictyon in his book, which seems to have originated in the circumstance of Dr. Wallich having overlooked the fact that pre-occupation only, can be permitted to set aside a defined and published name, and as the case affords an excellent illustration of the mischief resulting from a departure from the law of priority as established by definition and publication, I shall, so far as my information enables me, endeavour give a history of it and trace it to its consequences.

Roxburgh, in his Manuscript Flora Indica, had given the name *Hamiltonia* to a genus of plants, and sent drawings and descriptions of two species so named to the India House.

One of these was selected by Mr. Brown as Editor, for publication in the Coromandel Plants, but in the mean time, Willdenow (Sp. Plantar. 4., 1114), had pre-occupied the name, he (Brown) therefore changed Roxburgh's MS. name and substituted in Roxburgh's name the very appropriate and classically constructed name of *Spermadictyon*, which was accordingly published, giving Roxburgh's definition and description of the plant, with the plate. The name so published ought never afterwards to have been disturbed, nor indeed the existence of Hamiltonia, as a Roxburgian name, made known.

Dr. Wallich, however, when editing Dr. Roxburgh's Posthumous Flora, apparently, thinking he was not at liberty to alter the MS. retained the superseded name, adding a note, stating that "that was the genus called *Spermadictyon* in the Coromandel Plants, in consequence of the name *Hamiltonia* having been given by Willdenow (without any good reason in his opinion) to Michaux's *Pyrularia*." In so acting he, for the time, lost sight of the principle of definition and publication, so thoroughly fixing a name that nothing short of pre-occupation can authorize its being afterwards set aside or changed. But he has since corrected his error by restoring Spermadictyon in his list of Indian plants as has Steudel in his Nomenclator Botanicus.

But the mischief has not stopped there, for Steudel, while doing justice to *Spermadictyon* has, as shall be immediately shown, done an equal injustice to *Pyrularia* in superseding it by Willdenow's *Hamiltonia*. Schultes, Endlicher, and Meisner, on the contrary, concur in sacrificing Willdenow's *Hamiltonia* at the shrine of Michaux's *Pyrularia*, and *Spermadictyon* at that of Roxburgh's *Hamiltonia*.

DeCandolle, apparently endeavouring to escape the difficulty by steering a middle course, only made matters worse. He wishing to preserve Roxburgh's name, chooses to forget Willdenow's *Hamiltonia*, and then set about settling the difference between *Hamiltonia*, Roxb., and *Spermadictyon*, Roxb., which he did by quoting as authority for the former, the undefined name of Roxburgh's Catalogue of the Calcutta Bot. Garden, published in 1814 against the defined one of the Coromandel Plants published in 1819. This, as already said, only makes the matter worse, for while the law declares that an undefined catalogue name can never be allowed to take precedence of a fully defined and published one, he practically declares the reverse to be the correct rule, that is, that defined and published names ought to be set aside in favour of undefined catalogue ones of earlier date. In this proceeding he has, either through ignorance or carelessness, been most improperly followed by all subsequent writers on the genus, myself included. Steudel and Wallich being the only ones who have taken a correct view of the case.

Let us now turn to Willdenow's *Hamiltonia* and try it by the same standard. Wallich's note having informed me that, in his opinion, the name was given without any good reason, I was induced to follow up the inquiry to ascertain how far his opinion was well founded. The case stands thus.

Michaux published in 1803, in his North American Flora, his genus *Pyrularia*, duly defined, that is, so that it could be recognized by others. Willdenow, it would appear, had received specimens of the same plant named in a letter (I suppose of a prior date), *Hamiltonia oleifera*, and on the strength of this MS. priority adopted that name, giving Michaux's *Pyrularia pubera* as a synonym! Well might Dr. Wallich in such a case say, "for no good reason," but still, bad as the case is, it did not, as Wallich now admits, authorize the restoration of Roxburgh's name. The consequence of this blunder of Willdenow is, that both the Hamiltonias must be, indeed are, set aside and the name of that highly respected person does not now occupy a nitch in the Botanical temple, though both an Indian and American Botanist has respectively essayed to place it there: for, curiously enough, both, in giving the name, had the same person in view, Mr. William Hamilton of Philadelphia.

The corallaries from all this are sufficiently self evident—first, Jussieu—I write the word with reluctance, but truth compels me to say that the great and excellent Jussieu *erred*, in so dogmatically overruling the law of priority, thereby establishing a dangerous precedent. Secondly, he erred still more inexcusably in assuming the privilege of constituting himself the corrector of Linnæus in the matter of the formation of his generic names. Thirdly, Salisbury, Lamarck, Redouté, Endlicher, Meisner, and Kunth, have all erred to an equal or even greater extent in supporting him in this innovation, the consequences of which, as we have seen in the case of Willdenow's *Hamiltonia*, and Don's Fl. Nepalensis, have been most mischievous.

Having thus, after a protracted and patient examination, arrived at what I consider the rights of the case, I can no longer hesitate in adopting the Linnean name of his "*vere gloriosus flos*," as the only one, adjective though it be, having the slightest claim to be retained on the records of Botany.

Having the subject of names and naming of plants in hand, I think I may as well go a step further and advert, but very briefly, to the unhappy state of the Indian Flora in having its nomenclature so overwhelmed with undefined names. Turn where we will we are sure to meet with them. This great evil I have endeavoured in the course of this work to lessen by never in a single instance, knowingly, superseding an undefined name so long as I had the means of ascertaining correctly the plant to which it belonged. In all such cases I have felt anxious to fix by definition these floating names, for until defined they are no better.

Having been thus careful to avoid any departure from the courtesies of the science, I trust that those who use this book may always bear in mind that "two things are necessary before a Botanical name can acquire authority, viz., definition and publication," and not incautiously add to the existing almost insurmountable difficulties of unravelling our exceedingly perplexed synonyme by substituting, on the ground of priority, undefined names for defined ones. This I ask not for my own sake, but for that of my successors who become the sufferers.

This request applies alike to all undefined names wherever they occur, whether in Wallich's list or Wight's Catalogue; in Royle's or Wight's Illustrations, and Spicilegium, books which unavoidably abound in names, many of them undefined. Also to the lists now publishing in Germany, edited by Hohenacker which, I have reason to think, give new names to several plants, previously published in this work, and doubtless to many of those published in this and the preceding volume: in a word to all undefined names.

In a work of this magnitude, and produced under circumstances so unfavourable to accuracy, by my being cut off from all intercourse with Botanists or books and named plants beyond what my own rather limited library and herbarium provided; many errors must unavoidably have crept in: for such I ask no mercy, but I do, and ever shall, protest against my definitions being transferred to the undefined names of others because their names happened to exist in a catalogue or printed book before my defined ones were published.

The naturalist prizes the honor of naming the subjects he has studied and is about to add to the Catalogues of Natural History—it is usually his only reward for his pains-taking labour—and, as the laborer is worthy of his hire, that credit ought not on any account, to be wrested from him, and still less when to be conferred, perhaps, on a person utterly incompetent either to examine or define, or what is about as bad, on one too idle or indifferent to do so for himself.

One other subject remains to be very briefly adverted to. Universal practice, among the British residents of India, has fixed the orthography of the name of the neighbouring range of mountains which is now always written Neilgherry. In conformity with this spelling I, in latinizing the word for the formation of specific names of plants, have merely altered the termination, writing it Neilgherrensis. The writers, however, of the German catalogues, above alluded to, apparently thinking themselves better acquainted than we are, with the pronunciation and orthography of English words, take upon themselves to correct us, and therefore write the word Nilagiry and Nilagiricus, and have even, in at least one instance, altered our orthography to make it suit their conceptions of what is right. Against this presumptuous liberty, I here enter my most unqualified protest. We make no attempts to soften or amend the orthography of their, to us, harsh and often almost unpronounceable language, and neither ought they to venture on the task of attempting to adapt our softer and more flexible tongue to their pronounciation. Nor ought we to tolerate such interference.

2047. Gloriosa superba (Linn., *Methonica*, Jussieu, Endlicher, Meisner, Kunth), leaves cerriferous, the inferior ones oblong, the upper ones ovate lanceolate: sepals lanceolate, waved their whole length.

Coimbatore, Eastern slopes Neilgherries, Courtallum, &c., &c. Flowering during the autumnal months.

I have taken the liberty of removing this genus from Liliaceæ, in which it is usually placed, to *Uvulariea* and *Melanthaceæ*, should these orders be again united. My attention was first called to the subject by Dr. Stocks of Bombay who had previously arrived at the same conclusion. After looking into the matter, comparing living specimens with the characters of the orders, I felt, and still feel, at a loss, how to account for this genus having been so long permitted to retain its place among the Lilies, especially after the removal of Uvularia, a genus so closely allied that nearly the same words characterize both, with the exception of the revolute perianth.

2048. Disporum Leschenaultianum (Donn.), umbels sessile, 3–5-flowered: sepals ovato-lanceolate, acute, gibbous at the base, filaments about twice the length of the anthers, dilated at the base: style 3–4 times the length of the stigmas: leaves ovate, short petioled, acuminate.

Neilgherries, frequent, especially about the outskirts of woods, flowering during the rainy season, July and August.

In the accompanying plate I have represented two forms, one with drooping the other with erect flowers. It did not occur to me, when the drawings were made, to study carefully these forms with the growing plants before me, and now I am unable with certainty to say whether I have combined 2 species or 2 varieties. Judging from dried specimens, they are varieties only, but possibly in that I may be mistaken. However, here are both forms, and will I hope induce future explorers to undertake the solution of the question.

2049. Disporum mysorense (R. W.), umbels 3–4-flowered, terminal: sepals ovate, cuspidato-acuminate, not gibbous at the base: filaments curved, not dilated at the base, shorter than the sagittate incurved cuspidate anthers: style filiform, much longer than the short, almost inconspicuous, stigmas: leaves sub-sessile, broad, ovate, acuminate.

Babenbodin Hills, Mysore, Cleghorn. I only know this plant from dried specimens, for which I am indebted to the kindness of Dr. Cleghorn.

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2049. Disporum Ceylanicum (R. W.), umbels 3–5-flowered, terminal: sepals lanceolate acute or sub-acuminate, not gibbous at the base: filaments filiform, about twice the length of the oblong obtuse incumbent anthers: style filiform 3–4 times the length of the revolute stigmas: leaves sessile, ovate, lanceolate, attenuate at the apex, acute.

Ceylon. I am indebted to the late Colonel Walker for my specimens of this very distinct species.

2050. Ophiopogon Indicus (R. W., Rottler?), leaves narrow linear, acute, somewhat coriaceous, sheathing at the base: scape naked, about half the length of the leaves, racemose, secund: bracts subulate, shorter than the pedicels: flowers bell-shaped, sepals ovate, obtuse, longer than the filiform, acute, style: filaments short, cohering at the base, and with the sepals persistent: berries oval, pale blue when mature.

Neilgherries, Courtallum, Mysore, &c.

A widely diffused plant. I have taken the specific name from Royle's Illustrations, where he mentions an "O. Indicus, Rottler," but without a reference to a character to enable me to ascertain whether this be his plant, hence the query.

This genus and the following *(Peliosanthes)* are remarkable for bearing naked seed, that is the cells of the ovary do not enlarge with the growth of the ovules, which in course of time burst the walls of the cells and are then matured not in a seed vessel but exposed to the direct action of air and light. The testa becomes progressively succulent, finally giving these naked seed, a berry-like look. Sometimes the whole six ovules are matured, producing clusters of bright blue berries as shown at fig. 7. Sometime several of them abort as I have endeavoured to show at fig. 6, when 2 of the ovules are represented much larger that the adjoining aborted ones. When the whole attain maturity, as shown in figures 7 and 8, the clusters of bright blue berries then form a very pretty object. Mr. Brown was, I believe, the first who understood and explained this curious economy of these plants.

2051. Peliosanthes Courtallensis (R. W.), leaves very long petioled, lanceolate, acuminate, glabrous; petiols rather shorter than the limb, triangular: scape about the length of the petiols, subspicate: bracts subulate, as long as the flowers: perianth campanulate, 6-cleft, throat contracted by the antheriferous crown (dilated monodelphous filaments): anthers sessile, inserted within the margin of the crown: ovary 3-celled, with 3 erect ovules in each, 1 or 2 of each usually abort.

Courtallum, in dense woods, flowering February and March.

Figures 5 and 6 show the ovary in an advanced stage, but before the cells have given way; figure 7 after they have burst, and figure 8 in a somewhat more advanced stage of development.

2052. Peliosanthes Neilgherrensis (R. W.), leaves lanceolate, tapering at both ends, acuminate; limb about the length of the petiol: scape erect, racemose, shorter than the leaves: flowers drooping, campanulate, 6-cleft: antheriferous crown (dilated filaments) 6-parted (that is filaments six), short, dilated, inserted on the sepals: ovary 3-celled, ovules, usually, 4 in each cell; soon rupturing the walls: style 3 angular, short; stigmas 3, spreading: seed naked, testa fleshy blue: embryo cylindrical at the base of copious albumen.

Sispara, on the Western slopes of the Neilgherries, abundant by the road side and among the adjoining bushes, flowering January and February.

2053. Dianella ensifolia (Aiton), leaves numerous, long ensiform; margin prickly serrulate; keel rough at the base and apex: branches and branchlets of the panicle spreading: pedicels crowded, drooping, nearly as long as the flower.

Courtallum, Malabar Mountains.

The figure which was taken from an indifferent specimen of a growing plant, does not give a very good idea of the species, but the analyses are more perfect than any I have seen of this genus.

2054. Dracena terminalis (Willd.), stem fruticose, erect: leaves petioled, lanceolate, attenuated at both ends, stem-clasping at the base, glabrous: branches of the panicle divaricated, simple: flowers sessile, fascicled, 3–5 together, tubular, 6-cleft: filaments subulate; anthers incumbent: seed globose: albumen large: embryo small, lateral.

Courtallum, Quilon, perhaps in both instances the outcast of a garden. I do not recollect having met with it in situations that left no doubt of its being indigenous.

2055. Asparagus Asiaticus (Linn.), thorns solitary, recurved: stem erect, woody; branches filiform: leaves fascicled, subulate (setaceous), peduncles solitary.

Ootacamund, Neilgherries, frequent, growing in open ground: smaller specimens are quite erect, the more luxuriant ones, such as that selected for representation, drooping towards the extremity. The above is the only station I recollect having met with this plant, but it must also inhabit the lower heights on the Malabar Coast whence I presume Linnæus obtained his specimens. Lamarck describes it, from plants growing in the "Jardin du Roi." Lamarck quotes Pluk. tab. 15, f. 4, for this plant, but as it is without flowers it may serve as well or better for the next. All indeed that can be said for it that it is an Asparagus.

2056. Asparagus racemosus (Willd.), thorns solitary, reflexed; branches striated: leaves fascicled, linear, subulate, falcate, racemes many-flowered, axillary.

Coimbatore district, frequent, climbing extensively among hedges, and bushes. When in full flower, which it is during the autumnal rains, it is a charming plant, scenting the air for a considerable distance round with its delightful fragrance.

The genus Asparagus is referred by most Botanists to Liliaceæ. I am unable to understand on what grounds, as it associates so well with Smilax. Lindley excludes it from his class of Dictiogens, but, as it appears to me, on insufficient grounds, as the leaves of those species in which they are more developed show the reticulated tendency, and the woody structure of the stems of both is so perfectly alike that sections are scarcely distinguishable when lying side by side on the field of the microscope. For these reasons I have ventured to remove it from Liliaceæ and place it beside Smilax which I have no doubt is its proper place in the natural series.

2057-58. SMILAX ZEYLANICA (Linn.), stem scandent, obscurely 4-angled, beset, especially the male, with numerous small recurved prickles: leaves from cordato-ovate acuminate to sub-orbicular, abruptly retusely acuminate, 5-nerved; the outer pair slender: peduncles axillary, usually two, sometimes 3-umbelled: flowers longish pedicelled, male 6-androus, without rudimentary pistil: female with 3 rudimentary stamens opposite the outer sepals: berry globose, 3-seeded.

Neilgherries, Eastern slopes, frequent at an elevation of from 4 to 6 thousand feet, climbing to a great extent over trees. In flower and fruit from September until November or December.

2059. SMILAX MACULATA (Royle), shrubby, scandent, angular, armed with numerous small prickles: leaves broad sub-reniform-cordate at the base, tapering to a blunt point, 7-nerved, racemes, male and female, axillary, flexuose, with the flowers fascicled on the flexures, short pedicelled: female with six rudimentary stamens.

Eastern slopes of the Neilgherries, climbing extensively on trees. Berries red when ripe.

2060. DIOSCOREA ACULIATA (Linn.), herbaceous, twining, glabrous, branches piped, 4-winged: wings narrow membranous: leaves opposite, deeply cordate, 7-nerved, acuminate: male panicles axillary, branches fascicled, spiked, 4 to each pair of bracts, flexuose, with a single sessile flower on each flexure: interior sepals smaller, all obovate: ovary 3-celled with 2 superposed ovules in each, capsule 3-winged, seed winged.

Malabar. My specimens are from Malabar where I gathered it in flower and young fruit in June.

The representations of the mature capsule and seed in the plate are those of *D. oppositifolia*, those of *D. aculiata* not being sufficiently ripe.

ROXBURGHIA. (Driander.)

GEN. CHAR. Perianth: sepals 4, linear lanceolate, acute. Stamens 4, opposite the sepals; filaments short, dilated; connective produced far beyond the anthers, anther 2-celled, introrse; cells large, dehiscing their whole length, each enclosing a pollen bag (endothecium), nearly as long as the cell: pollen bags furrowed along the suture; persistent after dehiscence, the apex of each produced into a long flattened thread, which, converging and cohering with its fellow, forms a thin membranous lanceolate point (the nectary of Roxburgh), pollen farinaceous or, more correctly, something between waxy and farinaceous. "Germen (ovary) superior, cordate, compressed, 1-celled: ovules numerous, attached to the bottom of the cell, cordate. Style none, stigma pointed, capsule ovate, compressed, one-celled, 2-valved, opening from the apex. Seed 5-8, pedicelled, inserted on the bottom of the capsule, cylindrical striated: pedicels surrounded with numerous small pellucid vesicles." Roxb.

The description here given of the male organization of this genus is somewhat different from any hitherto proposed if I rightly understand them. According to this description, the stamens of *Roxburghia* represent, among monocotyledons, the Asclepiadeal structure. There the anther is two-celled with the pollen enclosed in a bag, the endothecium or lining of the anther cell. There, as here, the endothecium is prolonged: forming in them the connection between the corpuscle and pollen mass. So far the analogy in the male structure of the two families is clear, but here they diverge, the endothecium of Asclepiadeæ seperating entirely from the cell, and being removable with the pollen, while here it continues attached to the bottom of the cell. In Asclepiadeæ the pollen of two anthers converge to form the geminate pollen masses, here those of the two cells of the same anther are united. The remainder of the character I have taken from Roxburgh who examined and described the flower with most elaborate care, but evidently misunderstood its structure, a circumstance not much to be wondered at, considering the then imperfect knowledge of structural botany. Sir J. E. Smith gives the best description of the anthers I have seen: "Stamens, filaments 4, opposite the petals and nearly as long, awl-shaped, fleshy, with a double cell at their inner side near the base; anthers 2-lobed, oblong, lodged in the cells of the filaments, each crowned with a simple lanceolate appendage." This description differs from mine in his viewing the connective as a 2-celled filament and the pollen as the anther.

This view of the structure of the stamen of this genus may perhaps lead to the determination of its affinities, a point as yet very imperfectly understood.

When I wrote the above I had overlooked Griffith's paper in the Calcutta Journal, whose views nearly, I think, coincide with mine, a point I cannot now ascertain the volume being packed up and out of reach.

2061. ROXBURGHIA GLORIOSOIDES (Driander). Pulicat Hills at an elevation of about 2000 feet, flowering in August and September. The season at which I visited the station was a little too early, so that only a few flowers had opened and no fruit.

2062. ASPHODELUS PAUCIFLORA (R. W.), leaves fistulous, long tapering, subulate-pointed: stems naked, ramous: racemes terminal: flowers small, short pedicelled: filaments filiform, glabrous, scarcely dilated at the base: stigma subcapitate, undivided: seed somewhat triangular, ovate, blunt pointed.

The station of this plant, the only Indian representative of the genus I have at hand, is not marked, but most probably was obtained from the light sandy soils of the sea coast.

2063. URGENIA INDICA (Kunth, *Scilla Indica*, Roxb.), bulb tunicated: leaves narrow, and taper from the base: racemes simple, longer than the leaves: flowers remote, solitary, long pedicelled, drooping. Roxb.

Sea coast, Tutichorin, March and April.

Bulb white, about the size of an apple: leaves radical, ensiform, flat, glabrous, from 6 to 18 inches long. When in bloom the plant is perfectly destitute of leaves. Scape erect, round, naked: raceme long, erect, flowers remote, long pedicelled, drooping, pedicels filiform, bract most minute, caducous: sepals linear, equal, filaments filiform. Capsules, elliptic, many-seeded; seed compressed, orbicular, broadly winged, bright shining black: embryo length of the seed, axile.

The above description of the plant is taken from Roxburgh, that of the capsule and seed from specimens now before me.

2064. URGENIA COROMANDELIANA (R. W., Scilla Coromandeliana? Roxb.?), leaves linear, tapering to

the point, shorter than the scape: racemes erect, flowers short pedicelled, supported by a rather large scariose bract as long as the pedicel: sepals ovato-lanceolate, all equal, and beardless: style about the length of the stamens, capitate: capsule large, obsoletely 3-angled, 3-sided, seed obovate, orbicular, compressed, winged, shining black. Embryo about the length of the albumen.

Sea Coast, station not stated.

This differs in some respects from Roxburgh's description, which unfortunately does not include any account of the capsule and seed; I however, believe it is his plant.

2064. Urgenia congesta (R. W.), leaves linear subulate, about the length of the scape: scape erect, naked, raceme short, compact: flowers short pedicelled, supported at the base by a short broadish obtuse scariose bract: sepals lanceolate, the inner slightly smaller: ovary conical: capsule sub-obovate or globose, 3-celled: cells few- (3–4) seeded: seeds orbicular, bound all round by a broad wing, shining black.

Sea Coast, Malabar? station not mentioned.

The specimens from which these drawings are taken were not collected by me, hence the want of stations. They are all referable to the very modern genus Urgenia which was separated from Scilla on account of its numerous much compressed, not few globose, seeds, which is its distinguishing characteristic.

Commelynaceæ.

This, in the most favourable circumstances, is a difficult order to deal with as regards the discrimination of species, and in giving representations of the flower can only be done justice to from growing plants, hence I infer our comparatively imperfect acquaintance with its species. Having myself often experienced this difficulty, I think it will be doing a service, if I can, by giving representations of a considerable number, lighten the labours of others, who may wish to undertake their investigation. It is rather unfortunate that I delayed entering on their examination until this late date, as I have left myself neither the time nor room required to do them full justice, and what is worse, I have been constrained to take many of my drawings from dried plants in place of fresh ones. This I regret, but such is now my position that it is unavoidable, unless I leave them undone. I have, however, endeavoured to compensate for this defect, by greater care, especially as regards the analysis. In spite, however, of all my care, the relative sizes of parts, as shown in the magnified flowers, will sometimes be found defective as in several instances they were necessarily taken from young flowers artificially opened, and before the petaloid series had attained their full development, but the forms in these cases were as accurately preserved as it was possible, so that I trust no very striking discrepancy between the drawing and fresh flower will in any case be found, and as regards the outline of the plant I believe it is generally unexceptionable. My materials for illustrating the order are so considerable that I could easily have nearly doubled the number of subjects represented. I may here mention, for the encouragement of parties who may have an opportunity of collecting specimens, that I have learned in the course of their investigation, that much more can be done with dried specimens than I previously supposed possible, and would therefore urge their collection, as I feel quite convinced that the order is much richer in species than the latest publications would lead one to suppose. Roxburgh in his Flora Indica only describes 13, a very small number, and only to be accounted for by the insufficiency of the characters, as known at the time he wrote, for their discrimination.

At that time all the Indian species, indeed nearly the whole order, were grouped under two genera; one, *Commelyna*, having half the stamens sterile, the other, *Tradscantia*, having them all fertile and the filaments bearded. Brown struck off from the former, his genus *Aneilema*, and subsequently Don his *Cyanotis* from the latter. These separations, especially the first, gave greater precision to the generic characters, and have been followed since then by the addition of several well-defined genera.

Aneilema has already become so over-grown (Kunth enumerates 60 species) that it now requires sub-division. This I have attempted in my genus *Dictyospermum*, on the principle that, as in the true Aneilemas, the calycine series of stamens are fertile and the petaline sterile, so a departure from that arrangement, indicates such a change of structure as to justify generic separation where it occurs. In Dictyospermum the anterior petaline stamen is polleniferous and fertile, and the other two usually suppressed along with the posterior calycine one. This is the arrangement observed in *Commelyna*, which has 6 stamens divided into 2 sets, 3 anterior fertile, 3 posterior sterile, not, as in Aneilema, alternately fertile and sterile.

This arrangement of the stamens enables us to divide the genera struck off from the old genus Commelyna into two well defined groups, viz., anterior or petaline stamen, fertile, *Commelynæ*, all the petaline stamens sterile, *Aneilemæ*. Stamens all fertile and anthers conformable, *Tradescanteæ*.

Following out that grouping, we have for the first, *Commelyna*, *Heterocarpus*, *Aclesia*, *T. inantia*, *Dictyospermum* and *Dichorisandra?*; for the second *Aneilema*, and *Dichspermum*, and for the third, *Callesia*, *Pollia*, *Lamprocarpus*, *Dithyrocarpus*, *Tradescantia*, *Spironema*, *Cyonotis*, and *Cartonema*. I have separated *Dichspermum* from *Aneilema*, on the ground of its having two rows of seed in each cell, all the other species having one only. This I believe forms a good generic distinction. *Heterocarpus* is in like manner separated from *Commelyna* on account of difference of its fruit. In Commelyna the capsule is 3-celled, in Heterocarpus it is reduced to one, the other two aborting and shrivelling into a podocarp, to which the fertile indehiscent cell adheres. Of the propriety of constructing a genus on such grounds I feel less confident than on either of the preceding instances, but still I think it a good genus, the more so, as it does not rest on a solitary species, and is moreover strengthened by the circumstance of the two anterior sepals being connate.

I may here remark that Kunth in his Enumeratio, describes the fertile stamens of *Commelyna* and others of that group as posterior, while I describe them as anterior. I do not know how he views the flower, but I look at it from behind, and finding the odd sepal next the axis call it posterior and as a matter of course, the odd petal, being on the opposite side of the flower, must be anterior. In regard to the lobes of the perianth, I may remark that, theoretically,

both rows are sepals, the exterior calycine, the interior petaloid. I do not object to the theory, but its practical application is sometimes rather inconvenient. In such cases I have adopted the old nomenclature, calling the outer series calyx or sepal and the inner petals. This departure from strictly philosophical language can lead to no inconvenience as the aspect of the parts fully justify the proceeding.

2065. COMMELYNA BENGALENSIS (Linn.), stem ramous, creeping, pilose: leaves petioled, ovate, elliptic, subcordate at the base, acutish, puberulous on both sides, the hairs scattered and longer above; sheaths pilose, ciliate at the throat; ciliæ long, brownish; spathes short peduncled, cucullate (top-shaped,) acute, pubescent and pilose: peduncles paired, one incluse, 2-flowered, flowers hermaphrodite; the other exserted, roughish, one-flowered; flower male: sepals glanduloso-lineolate: the odd interior one (anterior petal) sessile, lanceolate.

Common all over India—frequent about Coimbatore. The plant selected for representation is an unusual form, the roots being apparently tuber-bearing. This, however, is in appearance only, the apparent tubers being in truth under ground flowers.

The plants grew in a light soil and had been several times disturbed by the plough. On pulling up one, finding the roots covered with these tubers I examined one and in place of a solid tuber found, on opening the enclosing spathe, that it contained a flower. This induced me to make the accompanying drawing, viewing the circumstance as a curious and unusual provision of nature to preserve a species which under its circumstances was in a fair way of being destroyed. The figures in the accompanying analysis marked with a cross (+) appertain to the root flowers.

2066. COMMELYNA POLYSPATHA (R. W.), herbaceous, erect, leaves long lanceolate acuminate, glabrous on both sides, paler beneath, sheaths with a line of hairs on one side, setosely hairy on the margin and throat: spathes terminal, 4–8 together, collateral, turbinate, glabrous: pedicel solitary, enclosed, 4–5-flowered: capsule glabrous, 3-celled; cells 1-seeded; seed oval, obtuse at both ends; hilum linear: embryo lateral.

Bolamputty Mountains near Coimbatore, at an elevation of about 3000 feet, frequent, flowering in November.

The flower of this species seems so exactly the same as that of C. Bengalensis, with the exception of a slight difference in size, that the one might almost be substituted for the other. The peduncle in this does not divide within the spathe, hence all the flowers seem to be hermaphrodite.

HETEROCARPUS. (R. W.)

GEN. CHAR. Flowers irregular: Perianth six-parted: 3 exterior lobes calycine, 3 interior petaloid: anterior calycine lobes obovate, obtuse, connate to near the apex, much larger than the posterior: anterior petaloid lobe subsessile, obovate, spathulate, lateral ones unguiculate. Stamens 6, filaments glabrous: 3 anterior anthers polleniferous, the middle one somewhat deformed—3 posterior sterile. Ovary 3-celled; 2 posterior cells minute, empty, afterwards changing into a rigid curved podocarp, anterior larger one ovuled, capsule 1-celled, attached by a groove on the back to the podocarp, indehiscent. Seed one, oval, embryo lateral.

Diffuse, herbaceous, ramous plants. Leaves sheathing, entire: peduncles springing from the sheaths, filiform, forked at the apex within the spathe: posterior branch much longer, exserted, bearing on the point a single male flower; anterior incluse, recurved, 4–5-flowered. Spathes cordate, acuminate, folded, sub-coriaceous, ciliate. Flowers yellow.

2067. HETEROCARPUS HIRSUTUS (R. W.), diffuse, everywhere pilose especially on the sheaths and under surfaces of the leaves: sheaths long: leaves linear lanceolate acute: spathe long acuminate, ciliate at the base.—The aspect of the plant apart from the inflorescence is much that of a hairy grass.

Neilgherries, among bushes, flowering August and September.

2067. HETEROCARPUS GLABER (R. W.), procumbent, diffuse, rooting at the joints, glabrous, except decurrent lines of short hairs from the insertions of the leaves and slightly pilose sheaths, leaves lanceolate obtuse, glabrous, sheaths short, pubescent: peduncles about the length or a little longer than the leaves, filiform, involucre cordate, acuminate, ciliate at the base.—Flowers deep orange yellow.

Paulghaut jungles and Bolamputty Hills, in moist soil, flowering October and November.

I have endeavoured in vain to refer either of these plants to any described species of Commelyna, the only genus to which I think they could have been referred.

2068. ACLISIA INDICA (R. W.), stem erect, simple, and with the panicle pubescent: leaves sheathing at the base, petioled, ovato-lanceolate, taperingly acuminate, acute, glabrous, except the petiol and sheath (10–12 inches long by two or 3 broad): panicle long peduncled, loose; branches racemose, spreading or slightly reflexed: petals obovato-orbicular, larger than the sepals: fruit globose, indehiscent, fragile, smooth, shining, pale blue, cells 8-seeded in two rows: seed flattened, depressed over the embryo, quadrangular.

Malabar, Ceylon, Western slopes of the Neilgherries, flowering during the rainy season.

This species seems very different from the only other known species of the genus, *A. scorzogonensis*, from Lugon Island, and so far as I can judge from specimens in fruit only, is a very handsome plant. The flowering specimen is imperfect, most of the flowers having fallen off in drying. The little flowering branch is to some extent fictitious, a flower being supplied to each empty bract to show what it is when in full flower.

DICTYOSPERMUM. (R. W.)

GEN. CHAR. Perianth six-parted, 3 exterior lobes calycine, the interior petaloid, all marcescent. Stamens 3 (rarely 5) all fertile, the middle one opposite the odd petal, slightly dissimilar: when 5, two sterile opposite the lateral petals, ovary 3-celled, with 1 ovule in each: ovule attached to the middle of the axis, horizontal; style filiform, stigma capitate. Capsule 3-celled, 3-valved; valves septiferous. Seed solitary, oblong, somewhat convex, reticulate on the back. Embryo lateral (not opposite the hilum).

H

Albumen horny white.—Herbaceous erect plants. Stems simple, leaves sheathing at the base, entire. Inflorescence panicled, terminal: flowers solitary, or two or three aggregated in a short sheathing bract, pedicelled; filaments beardless.

This genus approaches *Aclisia* and *Commelyna* in the position of its stamens, the middle fertile one being opposite the odd petal, and differs from *Aneilema* in which all the fertile stamens are opposite the calycine lobes of the perianth.

2069. Dictyospermum montanum (R. W., *Aneilema montana*, R. W., in Wall. List), erect: leaves longish petioled, lanceolate, acuminate, round, glabrous except on the margins; sheaths pubescent, truncated: panicle lax, terminal; branches slender, bearing a few flowers on the extremities: petals somewhat larger than the sepals: petaline stamen modified, filament longer and cells of the anther somewhat divaricated: styles simple, stigma capitate, capsule globose, smooth, shining, papery, fragile: seed corrugately reticulate on the back.

Courtallum, Neilgherries, Eastern slopes, in damp shady woods and on the banks of streams.

The Neilgherry plant differs slightly, the leaves are less waved, broader in the middle in proportion to their length, and shorter petioled, but in other respects both correspond.

2070. Dictyospermum ovalifolium (R. W.), erect: leaves sheathing, short petioled, oval, acuminate, acute, nerved; shortly pubescent on both sides: panicles terminal, sessile, compact, many-flowered: flowers short pedicelled, at length drooping: sepals and petals about equal, orbicular: filament of the petaline stamen longer than the others, at length spirally convolute: anthers all similar: style short, stigma simple: capsule obsoletely 3-angled, smooth, shining, brittle: seed oblong, reticulate on the back.

Neilgherries, Western slopes. This species turns black in drying.

2071. Dictyospermum protensum (R. W. *Aneilema protensa*, Wall. List, 5218), erect, pubescent: leaves vaginate, sessile, lanceolate, acuminate; sheaths loose, subtruncted, ciliate and like the upper surface of the leaves sprinkled with bristly hairs: panicles axillary and terminal, long peduncled; branches sub-umbellato-racemose: flowers pedicelled, 2 or 3 aggregated in the axils of cucullate bracts: sepals and petals about equal, shorter than the stamens; filaments slender filiform: anther of the petaline stamen larger: two sterile stamens: style filiform, stigma capitate: capsule pedicelled, hispid, unequal-sided.

Courtallum, Ceylon, Nepaul.

This is a widely distributed species. I have now specimens from Nepaul, Courtallum, and Ceylon, and I think I once met with it on the Neilgherries, but very sparingly and scarcely in flower.

In naming the drawing, I had an opportunity of comparing my own with Nepaul specimens, received from Dr. Wallich, which perfectly correspond with the Peninsular ones.

2072. Aneilema latifolium (R. W.), erect, glabrous: leaves sessile, broad ovate, cordate, stem clasping, acute, netted beneath, when dry, with brown veins; sheaths short, glabrous: panicles terminal, rather diffuse: bracts minute, exterior perianth (sepals) lanceolate acute; interior (petals), obovate or suborbicular: filaments all bearded: capsule 3-celled with several, 3–4, seed in each: seed angular, smooth, depressed above.

Western slopes, Neilgherries.

A very distinct and handsome species, which does not seem liable to be confounded with any of the others. Leaves about 6 inches long, by 2 broad, capsule coriaceous, glistening, whitish, scarcely exceeding the persistent sepal.

2073. Aneilema scapiflora (R. W., *Commelyna scapiflora*, Roxb., *An. tuberosa?* Ham., Wall. List, *Murdania scapiflora?* Royle), perennial, glabrous: leaves all radical, sheathing at the base, ensiform, somewhat waved on the margin: scapes panicled, remotely jointed, furnished at the joints with a somewhat scariose sheath, branchlets of the panicle springing from the axil of a short pointed sheath, 6–10-flowered: flowers pedicelled, bracteate: sepals lanceolate acute, petiols broad obovate or sub-orbicular: stamens 6, three fertile; lobes of the sterile anthers globose, divaricating; all the filaments bearded: capsule oblong, 3-celled; cells 4-seeded: seed angular, smooth.

Courtallum, flowering September.

My drawing is taken from a dried specimen with fruit, generally, nearly mature and does not therefore give a good idea of the flowering plant. Neither Roxburgh nor Royle mentions the fruit, though the latter constitutes this a new genus. Royle's figure does not much resemble mine, but the difference seems to depend on his being younger and a less luxuriant form. The open flower of my drawing is taken from an unopened one, and may not represent the correct proportions of the parts as seen in naturally opened ones, but if they do represent the correct proportions, it seems to me this can scarcely be Roxburgh's plant, as he distinctly mentions the petals being longer than the calyx. The inflorescence too seems different, that of mine being properly a panicle, while he calls his a raceme, but describes it as having "branchlets," thus showing that it has the elements of a panicle, only wanting luxuriance to develope it, as shown in my plant.

2074. Aneilema ensifolia (R. W.), perennial? erect, ramous, glabrous, jointed: leaves very long, narrow, sword-shaped, slightly sheathing and stem-clasping at the base (12–19 inches long, ½ to ¾ broad): primary branches of the panicle (3–4) umbellate, branched: branches secundly racemose towards the extremities: flowers fascicled, 3–4 together in the axil of a large obovate caducous bract, opening in succession: sepals ovate somewhat boat-shaped: petals broad obovate or sub-orbicular, filaments all bearded: sterile anthers auricled; capsule ovoid, 3-celled, with 3 rough angular seeds in each.

Courtallum, Ceylon.

The roots, judging from one of my specimens, are thick and succulent, apparently perennial. The stems seem to rise to the height of 4 or 5 feet, the whole plant glabrous. The umbellate inflorescence added to the caducous tendency of the flowers, leaving a long line of prominent scars along one side of the floriferous branches, form a peculiar and striking feature which I have only met with in one other species. See next plate.

2075. Aneilema secunda (R. W.), stems procumbent at the base, ascending, glabrous, leaves distant, glabrous, sheathing, sessile, linear lanceolate, tapering to a slender point; sheaths slightly pubescent, ciliate: panicles terminal and axillary, long peduncled: branches racemose, slender, cernuous: flowers numerous towards the apex, secund, furnished with a large boat-shaped membranous caducous bract: sepals 3, ovato-lanceolate: petals larger, sub-orbicular (blue): stamens 6, two fertile, 3 with effete anthers, and the posterior one rudimentary, but with the filament bearded: filaments of the 2 fertile stamens bearded. Ovary 3-celled, 2 ovules in each: style and stigma simple: capsule 3-celled with 1 or 2 seed in each.

Anamallay forests, Belgaum, flowering August and September.

2075. Aneilema paniculata (R. W., an Herb. Wight in Wall. List, 5216 ?), erect, ramous, glabrous, except the ciliate margin of the sheath: leaves succulent, sheathing, sessile, ovato-lanceolate, blunt pointed, margined with a narrow diaphanous purplish edging: panicles axillary and terminal, peduncles slender, somewhat dichotomously branched: flowers pedicelled, at first aggregated on the points of the branches, but opening in succession, sepals lanceolate about half the size of the obovate obtuse petals: fertile filaments bearded about twice the length of the nearly beardless sterile ones, capsule 3-celled with 3–5 superposed angular seed in each.

Courtallum, Bolamputty, Neilgherries, flowering during the rainy season, very like in habit and appearance *Dichœspermum lanceolatum*, but at once distinguished by the capsule.

2076. Aneilema vaginata (R. B., Wall. List 5212 B!), procumbent, diffuse, rooting at the joints, glabrous: leaves sheathing at the base, linear: peduncles lateral and terminal, enclosed in a sheath, 1-flowered; but sometimes 3 flowers from one common sheath: sepals lanceolate: petals orbicular, 2 stamens fertile, 4 sterile antherless, all the filaments glabrous: capsule orbicular, 3-celled; cells one-seeded: oval compressed, somewhat rugous on the margin, depressed on the back.

The drawing is taken from a specimen named as above, received from Dr. Wallich, hence is certainly his plant. Kunth quotes it with a doubt as to its being Brown's species which is said to have bearded filaments, in this specimen they are beardless.

2076. Aneilema terminalis (R. W.), procumbent at the base, afterwards ascending: leaves sword-shaped, glabrous: sheath short, loose, ciliate on the margin: floriferous branches few from the upper axils, bearing on the apex a fascicle of close-set short peduncled flowers: sepals ovate obtuse, petals orbicular: stamens 2 fertile, 4 sterile: filaments of the perfect stamens bearded: capsule 3-celled with 2 seed in each attached to the middle of the axis (ascending and descending) seed roughish, embryo lateral.

Neilgherries. This seems very distinct from all the described species, but accords both in habit and structure of the flowers with the preceding, from which, however, it is a widely distinct species. The relative size of the sepals and petals cannot be relied on in these figures, the drawing of the open flower being in both taken from unopened buds.

2077. Aneilema nana (Kunth, *Commelyna nana*, Roxb.), creeping: leaves cordato-lanceolate, stem-clasping: flowers terminal, somewhat panicled, petals equal: capsule 3-celled, many-seeded. Roxb. Cells 3–5-seeded, seed angular or somewhat cylindrical, truncated.

Courtallum, Malabar, Coimbatore, in low wet soil.

This species, like all common and widely distributed plants, presents considerable variations in form, but they generally correspond in the outline, however much they may vary in size. It greatly resembles, except in habit, *A. paniculata*, but differs in the sterile stamens being beardless, while they are bearded in the other. The capsule in both is much alike, the cells containing from 3 to 5 seed.

2077. Aneilema pauciflora (R. W.), creeping, glabrous, except a line of hairs decurrent from the sheaths: leaves sheathing, cordato-ovate, obtuse, slightly waved on the margin, stem-clasping: flowers axillary, solitary or paired, opening in succession, longish peduncled, sepals linear obtuse, petals obovate, exceeding the sepals, filaments all glabrous, fertile stamens about twice the length of the sterile ones, capsule oblong pointed, cells about 5-seeded in a single row.

Quilon, Paulghaut, &c., in moist soil, flowering in October. This is a very distinct species, not likely to be mistaken for any other.

Dichœspermum. (R. W.)

Gen. Char. Perianth 6-parted, 3 exterior lobes calycine, 3 interior petaloid. Stamens 6 (filaments bearded or glabrous), 3 calycine fertile, 3 petaline sterile. Ovary 3-celled; style simple, stigma capitate. Capsule 3-valved, 3-celled; valves septiferous: 2 rows of superposed seed in each cell. Seed angular, smooth. Embryo depressed in the middle of the back.—Small herbaceous erect or procumbent ramous plants. Leaves scarcely sheathing. Inflorescence panicled, terminal; or axillary and lateral. Flowers blue, seed when dry brownish.

In addition to the three species represented in the accompanying plate, I have what seems to be 4 others, two referable to the *lanceolatum* form, and two the *juncoides*. It is possible these may be varieties only, but if so, they are very distinct ones.

2078. Dichœspermum lanceolatum (R. W.), procumbent at the base, rooting, afterwards erect, glabrous: leaves linear lanceolate bluntish: panicles terminal, racemose, branches flexuose: pedicels from the axils of loose cucullate bracts: all the filaments hairy near the base: capsule oblong, three-celled, each cell containing about 20 seed in two rows.

Malabar, about Quilon, in marshy soil.

2078. Dichœspermum juncoides (R. W.), erect, ramous; leaves linear subulate, glabrous, panicles few-flowered, axillary and terminal: filaments all glabrous, capsule oval obtuse, 3-celled: cells 6–8-seeded, in 2 rows.

Courtallum, Quilon.

This species reminds one of some of the more diminutive forms of *Juncus lampocarpus* or *uligruosus*, hence the name.

2078. Dichœspermum repens (R. W.), procumbent, rooting at the joints, glabrous except a decur-

rent line of hairs from the insertions of the leaves, leaves scarcely sheathing, sessile, ovato-lanceolate, sub-acute: flowers axillary, two or three from each axile, filaments glabrous, capsule ovate, cells about 8-seeded, in 2 rows.

Quilon, October to December, in low wet ground.

2079. DITHYROCARPUS PETIOLATUS (R. W.), ascending, sparingly ramous: leaves sheathing, ellipticolanceolate acute, tapering at the base into a longish petiol; sheath inflated, ciliate on the margin: panicle terminal; branches racemose, flowers secund and, with the rachis, villous.

Neilgherries. I am still uncertain whether I ought to consider this a distinct species or a mere form of *D. Rothii*. All the three species here represented are very like, and if really species prove this to be a very natural genus, but still the differences seem such as to preclude their being united, certainly not until we have had opportunities of studying them better than I have had it in my power to do. The *Aneilema hispida* of Wallich's list certainly belongs to this genus.

2080. DITHYROCARPUS ROTHII (R. W., *Tradescantia paniculata*, Roth. not Roxb.), stem creeping at the base, erect at the apex: leaves sheathing, lanceolate, acuminate; sheaths ciliately woolly: panicle terminal, somewhat globose, compact; branches racemose, many-flowered, densely villous, viscid, anterior petal much narrower, sub-spathulate: filaments glabrous: stigma obtuse: capsule 2-celled, with a single sub-lenticular seed in each.

Neilgherries, Ceylon? Roth remarks that his plant does not correspond with Roxburgh's figure, but I think his description corresponds with mine; which is certainly not Roxburgh's plant, so far at least as can be made out from his figure and description. The figure differs in the form of the leaves and sheath (which is woolly on the margin), in the composition of the panicle, which as shown by him is distinctly compound, each branch panicled, while in mine they are racemose. In his the calyx is said to be simply hairy while here it is shaggy and viscid. I cannot so well compare the flowers as my drawing is made from a dried plant, and may not be so correctly represented as in his. Roth describes the capsule as 3-celled, perhaps a typographical error.

2080. DITHYROCARPUS UNDULATUS (R. W.), ascending: leaves ovato-lanceolate, acuminate, waved on the margin, sheathing: sheaths large inflated, the throat thickly beset with coarse bristly hairs: panicles terminal, branches racemose: calyx shaggy, viscid, lobes obovate obtuse: odd petal narrow obtuse sub-cuniate: style filiform, curved: stigma simple: capsule 2-celled, 2-seeded.

Station. I am uncertain whence I obtained this plant. It is nearly allied to the preceding, but I think certainly distinct, its whole aspect being so different. The leaves and sheaths externally are glabrous, but a line of hairs extends down the stem from the woolly margins of the sheaths.

2081. STREPTOLIRION VOLBUILE (Edgeworth, Linnean Trans.)

I am uncertain now whence I obtained the plant from which the drawing was taken, but I think from Assam, about 15 years ago, at which time the drawing was made. I shall somewhat abridge Mr. Edgeworth's description of the plant which is very full. Glabrous, twining; stems rooting at the base: leaves cordate acuminate, long petioled; petiols sheathing at the base; sheaths truncated, ciliate: racemules axillary and terminal, 2–6-flowered: floral leaves becoming modified, losing their sheaths, the petiols shortening or disappearing and the limb changing to cordato-ovate, acute or folded: upper flower of the raceme often sterile: bracts lanceolate, delicately membranous: three exterior lobes of the perianth elliptic acutish; interior ones linear, a little dilated at the apex: stamens six, filaments bearded, with yellow hairs above the middle; anthers versatile, cells horizontally divaricated: ovary tapering into the style; stigma capitate, puberulous: capsule ovate, 3-celled, 3-valved; cells 2-seeded: seed slightly angular, rugosely furrowed.

This genus differs but little except in habit from *Tradescantia*. The perianth is the same with the exception of the petals being smaller than the sepals and the filaments in both are bearded and all the anthers polleniferous. The form of the anthers however is peculiar in so far as they resemble in form the sterile anthers of Aneilemas. The habit is very distinct, and, added to the above differences, well entitles this plant to form the type of a distinct genus. It ranks between *Aneilema* and *Tradescantia* rather than between *Tradescantia* and *Cyanotis* on account of the anthers forming an easy transition from the one to the other.

2082. CYANOTIS CRISTATA (Ræm. and Sch., *Commelyna cristata*, Lin., *not* Burm. Fl. Ind. tab. 7. f. 4. *Tradescantia imbricata?* Roxb.), lower part of the stem diffuse, creeping; floriferous extremities ascending or erect, marked with attenuate pubescent lines decurrent from the sheaths of the leaves and sprinkled with long hairs: leaves sessile, succulent, ovato-lanceolate, glabrous, slightly ciliate: spikes terminal, secund, progressively lengthening from 2 to 12–15 pairs of bracts: bracts lanceolato-falcate, imbricate, each supporting a flower: flowers small, scarcely exserted, sepals lanceolate acute, pubescent, petals connate to near the apex, limb obtuse: stamens scarcely exserted, filaments simple, bearded: style glabrous: stigma capitate: capsule ovate, cells 2-seeded.

Bolamputty Hills, frequent in woods, flowering November and December. I have extended the character of this plant under the impression that more than one species is confused under this name. My plant seems to correspond sufficiently well with Linnæus' figure in the Flora Zeylanica, but not with Burmann's, in the Flora Indica, of which also, I think, I have specimens, a figure of which is given in plate No. 2088.

2083. CYANOTIS PILOSA (Ræm. and Sch., *Tradescantia pilosa*, Willd. Herb.), stems scapose, procumbent, spreading, somewhat branched and, with sheaths and under surface of the leaves, more or less floccose: radical leaves long linear, obtuse, villoso-ciliate: stem leaves like the radical ones, but smaller: spikes terminal, secund, aggregated, few-flowered: bracts falcate, calyx woolly, lobes lanceolate acute, filaments densely bearded, not tumid at the apex: ovary pilose; style bearded: stigma clavate: capsule small, cells 2-seeded.

Neilgherries, flowering at all seasons: very frequent, from an elevation of about 6000 feet and upwards. This species principally differs from *C. tuberosa* (which in habit it greatly resembles), in the filaments not being tumid at the apex, and the style being as densely bearded as the filaments while it is glabrous in *tuberosa*, and in the aggregated few-flowered spikes.

2084. Cyanotis longifolia (R. W.), leaves radical, ensiform, pubescently ciliate on the margin: stems scapose, branched with a villous line decurrent from the sheaths: floriferous branches axillary, solitary or aggregated, from the loose sheathing axils of large common bracts: spikes lateral and terminal, imbricated; when lateral furnished with a common bract; partial bracts falcate, villoso-ciliate: calycine lobes of the perianth lanceolate acute, pubescent; limb of the petaloid ones broad obovate, glabrous: filaments long slender, flexuose, densely bearded near the apex: style length of the stamens, glabrous: stigma clavate: capsule small (not half the length of the calyx), subglobose, pilose on the apex, 3-celled: cells 2-seeded, seed angular, depressed-punctuate.

Bolamputty Hills, near Coimbatore, flowering November and December.

I was only fortunate enough to obtain one or two plants of this noble species and not so perfect in regard to the radical leaves as I could have wished.

2085. Cyanotis lanceolata (R. W.), stems at first procumbent, afterwards ascending or erect, round, succulent: leaves shortly sheathing, succulent, ovato-lanceolate, acute, slightly villous beneath, ciliate: a line of hairs decurrent from the sheaths: spikes axillary within the sheaths, few-flowered: bracts lanceolate acute: calycine lobes lanceolate, acute: petals scarcely connate, obovate obtuse, scarcely exceeding the calyx: filaments filiform, bearded above the middle: style filiform: stigma simple: capsule obovate, pubescent on the apex, much shorter than the sepals, 3-celled; cells 2-seeded: seed somewhat corrugated.

Eastern slopes of the Neilgherries, abundant in rich vegetable soil under the shade of trees, flowering October and November. In favourable situations it forms large patches attaining the height of from 3 to 4 feet. The plant is handsome, the foliage bright deep shining green, edged with delicate white ciliæ, but the flowers are inconspicuous.

2086. Cyanotis rosea (R. W.), stems procumbent, rooting at the lower joints, afterwards ascending, succulent, floccosely woolly: leaves sessile on short loose sheaths, cordato-ovate, obtuse, succulent, floccose: peduncles axillary, solitary or two or three from the same axile, longer than the leaves: spike short, imbricated; bracts falcate, woolly: calyx diaphanous, thickly clothed with long woolly hairs: corolla longer than the calyx, deep rose colour: stamens exceeding the corolla, sparingly bearded towards the apex, stigma inflated, clavate: capsule 3-celled with 2 oblong deeply corrugated seeds in each cell.

Bolamputty Hills near Coimbatore, flowering and in fruit November and December.

The succulent habit, floccose pubescence, very woolly calyx, and rose-coloured flowers mark this as a very distinct species.

2086. Cyanotis Lawiana (R. W.), procumbent, diffuse, succulent, villous: leaves sheathing, linear lanceolate, obtuse, succulent, villous: peduncles axillary, solitary or paired, slender, longer than the leaves: spikes short, few-flowered, woolly, involucral leaf folded, lanceolato-acuminate, bracts falcate, 2–4 pairs: sepals free to the base, lanceolate: filaments simple, bearded near the apex; style and stigma simple: capsule ovate obtuse, hairy on the apex: cells 2-seeded.—The flowers appear to be red.

Dharwar, on rocks, Law.

I am indebted to Mr. Law for the specimen represented.

2086. Cyanotis fasciculata? (Ræm. and Sch., *Tradescantia fasciculata?* Roth), woolly, diffuse, ascending, leafy and branching from the base: leaves sheathing, linear lanceolate, acute: sheaths loose: peduncles terminal, short: spike secund, few-flowered: involucral leaf ovate; bracts 3–4 pairs, falcate, imbricate, woolly: calyx lobes lanceolate, ciliate, filaments bearded, not tumid, style glabrous, tumid at the apex: capsule 3-celled, 2 seed in each.

Malabar. I have added a mark of doubt to the specific name, though I almost think unnecessarily, the plant agrees so well with the description, because Roth describes the stamens of his plant as glabrous while in mine they are bearded. The habit, which is well preserved in the drawing, quite agrees with the description: "stem from a finger to a span, obliquely ascending, weak, diffuse, filiform, leafy and branched from the base." The rest of the description with the single exception of the filaments corresponds equally well. Roth compares his plant with *Trad. cristata*, Linn., deriving his knowledge of its aspect, I presume, from Burmann's figure, which is very unlike Linnæus', in the Flora Zeylanica, and proves that the two plants, though of the same genus, are very different species. It is I think much more nearly related to Burmann's *Commel. papilionacea*, *T. papilionacea*, Lin., if indeed it be not that plant. It is evidently nearly allied to my *C. Lawiana*, but differs in having the stigma tumid, and very short peduncles, also in the less lax habit.

2087. Cyanotis dichrotricha (Stock's MS.), stem erect, simple, sparingly villous: leaves sheathing, sessile, succulent, linear lanceolate, villous: peduncles axillary, solitary, longer than the leaves: spikes few-flowered, woolly: calyx 3-parted to the base; lobes lanceolate, very woolly: filaments tumid and bearded near the apex: stigma clavate: capsule?— Flowers red.

Heura, Stocks. In the dried plant I have not succeeded in making out the character suggested by the name, two-coloured hairs, which I imagine applies to those of the filaments.

2087. Cyanotis sarmentosa (R. W.), root tuberous, stems long, succulent, pubescent, sarmentose: leaves radical, distichous, linear, blunt, villous: spikes secund, short peduncled, scapose, many-flowered: spathes short, ovate acute: bracts numerous (5–10 pairs), falcate, acute, somewhat woolly: petals connate to near the apex, limb roundish cuspidate: filaments much longer than the perianth, bearded and tumid near the apex: style glabrous, tumid: stigma sub-capitate: capsule 3-celled, seed 2 superposed.—Flowers and stamens pale rose colour.

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Bolamputty, December—but very sparingly in flower. I have not myself seen this plant growing, the specimens were brought by my collector. I have described the leaves as all radical and the flowers scapose, because they spring from the joints of runners, the plant being without stems. The leaves from the central tuberous root are larger than those on the runners, but otherwise quite the same and the peduncle springs as a short scape from the joint.

2088. CYANOTIS DECUMBENS (R. W.), decumbent, very branchy, woolly all over, especially the sheaths of the leaves: leaves linear lanceolate, bluntish; above sparingly, beneath densely woolly; sheaths short, loose: peduncles axillary and terminal, solitary or two or three aggregated, longer than the leaves: spike short, 4–6 pairs of imbricating falcate bracts: calyx 3-parted, woolly, as long as the capsule: filaments bearded, simple: style glabrous, tumid at the apex, capsule furnished on the apex with a tuft of rigid hairs.

Quilon, Malabar.—I begin now to entertain doubts whether I ought not rather to view this as a very luxuriant form of the preceding than as a distinct species.

These six species all coincide in the peculiarity of having pink-coloured flowers. They are all very nearly allied, so nearly indeed that it seems not improbable some of them will yet be reduced, but so far as my present materials enable me to judge, they seem all distinct and readily distinguishable.

2088. CYANOTIS VAGINATA (R. W.), erect or ascending, very ramous: lower part of the stem clothed with the persistent sheaths of aborted or fallen leaves: leaves sessile, somewhat stem-clasping, ovato-lanceolate, acute, clothed on both sides with long slender hairs: peduncles axillary and terminal, solitary or aggregated: spikes 10–14-flowered: calyx lobes lanceolate acute, filaments simple, bearded: stigma subcapitate: capsule 3-celled; 3-valved, valves deciduous, separating from the persistent 3-lobed placenta, seed two in each cell, superposed.

Malabar.

This and the two following species present the unusual peculiarity, met with in some Euphorbiaceæ, of throwing off the valves of the capsule, leaving the placentary axis in its place. The upper half of the placenta, that above the insertion of the seed, is 3-lobed and has a loose cellular texture, the lower half is firm. This feature marks these as constituting a distinct and peculiar group.

2089. CYANOTIS PAPILIONACEA (Ræm. and Sch.), stem creeping, leaves linear lanceolate; pilose beneath, ciliate near the base: sheaths short, loose: peduncles axillary, terminal, pilose on one side, solitary or two or three aggregated, about the length of the leaves: spike 4–12-flowered: bracts 2–6 pairs, ciliate, falcate: filaments bearded, simple: stigma clavate: valves of the capsule separating from the persistent axile placenta.

Malabar. The *Commelyna papilionacea* of Burmann, the type of this species, is a very obscure plant, rendered still more so by the figure he has given to illustrate it, which seems more calculated to mislead than aid in recognizing his plant. In naming this species I have been guided rather by Kunth's description than the figure, and as they seem to correspond, so far as the description goes, I trust I have given the name to the right object.

2089. CYANOTIS BURMANNIANA (R. W., *Com. cristata?* Burm. *not* Linn.), creeping, diffuse, branched: branches filiform, pilose: leaves sheathing, sessile, ovato-lanceolate, obtuse, villous: peduncles axillary and terminal; solitary or aggregated, longer than the leaves: spikes secund, 8–12 or more flowered: bracts 4–6 pairs, falcate, ciliate: lobes of the calyx lanceolate acute: filaments bearded: style simple, not tumid at the apex: stigma sub-capitate, placenta separating from the valves of the capsule, persistent, lobes subulate.

Quilon, Malabar.

I quote with doubt, Burmann's figure, though, I think, I may almost do so with confidence, at least with as much confidence as it would be safe to quote any of his figures of *Commelyna*, which seem all miserably bad. But bad as it is, I cannot reconcile myself to receive it as a figure of the plant, represented in plate 1, Flora Zeylanica, and given as the true *cristata* by Linnæus himself.

GOVINDOOIA. (R. W.)

GEN. CHAR. Lateral sepals connate to near the apex; dilated-sack-like at the base: posterior one like the petals and free to the base. Lip posticous ovato-obtuse, quite entire, embraced and concealed by the larger connate sepals, calcarate: spur enclosed within the sack of the sepals. Column elongated, stigma beaked, two-cleft. Anther dorsal, two-celled: pollenia two-beaked ending in a long slender caudiculus and oblong stigmatic gland.—A terestrial, erect, somewhat branched plant: leaves sheathing at the base, sessile, broad ovate acute, coarsely plicately-nerved, glabrous. Spikes terminal, compactly many-flowered; each flower supported by a longish subulate bract.

This plant seems evidently to belong to Lindley's division Cranichidæ though differing in its prolonged rostrate fertile, not truncated, rostellum, but so far as I can discover, does not enter into any of the genera of that tribe on which account I have made it the type of a new genus, the essential distinguishing feature of which is the remarkable conformation of the lateral sepals. These are respectively so much produced that by their union they are enabled to form a sack, at first sight resembling the spur, so common in the order, but which, when opened, is found to contain the proper spur. This of itself, seems to me, to constitute a very sufficient generic distinction and, when added to the very long column and tapering rostellum, so different from the truncated forms common to this division of the tribe, the tapering filiform caudiculus, and the oblong stigmatic gland of the pollinia, leaves no doubt of this being a very distinct genus.

I have dedicated it to the artist whose facile pencil produced the drawings for the greater part of the plates of the last three volumes of this work, and whose skill in analytical delineation is, I believe, as yet quite unrivalled among his countrymen, and, but for his imperfect knowledge of perspective, rarely excelled by European artists.

Three Indian Botanists have now essayed to commemorate in this way the botanical merits of deserv-

ing natives of India, but as yet all unsuccessfully. The first of these, Wallich's *Kurremia*, seems to have merged into Hamilton's *Bhesa*, or if not, is virtually only known by name to science, no authoritative definition of the genus having as yet been published. Royle's *Murdania* is a species of *Aneilema*, and Mr. Thwaites' supposed new genus was, fortunately, ascertained, when passing through the press, to exist under another name. Whether *Kurremia* will ultimately prove a good genus is a question still *subjudice*. These repeated failures are certainly discouraging to further attempts, but notwithstanding I am encouraged to make it, on account of the great merit of the man, and in the conviction that I cannot be mistaken in considering a genus, so singular in its characters, quite new to science, so far at least as its records have yet reached me. The name, too, fortunately, even to Western ears, is not uneuphonious.

2090. Govindooia nervosa. (R. W.)

Courtallum, in forests, flowering August and September. A low herbaceous plant from 8 to 12 inches high, sparingly branched, each branch ending in a shortish spike; leaves from 3 to 5 inches long and from 2 to 3 broad at the broadest point.

Elatostoma.

Under No. 1984 I expressed a hope that in a subsequent plate I should be able to supply the deficiencies of that and the two other plates illustrative of this genus. In the accompanying one, I give figures of the male forms of *E. cuspidata*, and *ovata*, but I have not yet obtained female ones of *E. lineolata*. To these I have added figures of other two, small species, to fill the plate.

2091. Elatostoma cuniata (R. W.), erect, simple, leaves obovate cuniate, unequal-sided, crenately serrated towards the apex; pilose on both sides, above mixed with scattered bristly hairs: receptacles sessile, unsexual: female, fertile flowers few, sessile, mixed with numerous pedicelled 3-4-lobed sterile ones: nuts oval, ribbed.

Belgaum, Law and Dalzell.

Both these gentlemen favoured me with specimens of this plant. It seems a very distinct species and a true congener of the alternate-leaved division of this genus.

2091. Elatostoma surculosa (R. W.), erect, spreading on all sides by means of suckers: leaves sub-sessile, ovate acuminate, unequal-sided, coarsely serrated except near the base, lineolate, glabrous: male receptacle peduncled, involucrate, male flowers pedicelled, 4-lobed: female receptacle and flowers sessile, flowers mixed with numerous pedicelled sterile ones; sterile ones simply capitate, or 3-4-lobed: nut oval, ribbed.

Neilgherries, on loose moist vegetable soil, near the banks of streams or rills.

POUZOLZIA.

THE genus Pouzolzia was established by Gaudichaud for the reception of some plants previously referred by Linnæus and others to *Parietaria*, and by Roxburgh and other Indian Botanists to *Urtica*. He separated it from the former of these genera, on account of the species he knew having a linear not capitato-villous stigma, and winged, not simply ovate, ribbed fruit. I here use the term fruit to designate the nut with its enclosing persistent calyx or perianth. His words are, "*Fem.* calyx fructifer profunde sulcato-angulatus vel complanato-bialatus, inferne ad utrumque latus cristatus, gibbus vel nudus, limbo parvo bilobo (lobis 2 alternis abortientibus?). Stigma sessile, elongatum, ad unum latus villosum." His character of Parietaria being, "*Fem.* calyx tubulosus 4-lobus. Stylus filiformis. Stigma capitato-villosum."

These distinctions have not been deemed of sufficient weight by either Endlicher or Meisner to keep the two genera distinct, the former having altogether rejected the new genus, while the latter has merely given its essential character, retaining it as a subgenus of Parietaria. Mr. Bennett (Pl. Javan. rar.), however, takes a different view and adopts the genus. After stating that Gaudichaud had sub-divided the Linnean genus Parietaria into seven distinct groups, founded chiefly on modifications of the fructiferous calyx, he continues, "among these groups, that to which he has applied the name Pouzolzia is particularly well marked by the distinct habit of most of the species composing it, and by the geographical distribution, as well as by the peculiar characters of their fructification. These characters consist in the female perianth enlarging in size and changing in form as the fruit advances to maturity, and finally constituting, at the completion of that period, an undivided envelope, closely applied to the surface of the seed, and furnished with a series of projecting ribs (most commonly double in number to that of the parts forming the male perianth), with the frequent development (sometimes additional, sometimes at the expense of the ribs) of two broad wing-like expansions, bearing a strong external resemblance to the wings of the seed-vessel of *Oxyria*. The presence or absence of these wings in the different species appears to afford so obvious a character in the ripe state of the fruit, that I should have been tempted to carry still further the sub-division of the Linnean group and to regard the *Pouzolzia* of M. Gaudichaud as resolvable into two genera, were it not that in the earlier stage, there exist no sufficient means of distinction, and that even in the ripe state and in those species which are most obviously furnished with wings, those organs appear occasionally to remain undeveloped in some few of the flowers, although the great majority continue to produce them. It will therefore, perhaps, be more advisable to regard the distinction as only of sectional importance."

From this extract we learn that the stability of the genus rests even more on the well marked habit of most of the species and their geographical distribution than on the peculiar characters of their fructification which is so inconstant as not to admit of the winged division being separated from the wingless; or in other words that *Pouzolzias* are tropical *Parietarias* with filiform stigmas, thereby confirming the views of Endlicher and Meisner. That such is really the case will, I think, be amply proved in the course of this monograph by the occurrence of species, the fruit of which is scarcely ribbed, others in which it is traversed with prominent ridges and deep furrows; many in which both ribbed and winged seed occur in the same fascicles, some with three wings and several with four amply developed, and lastly we have one with cymose male inflorescence, and wingless seed, nearly as in *Parietaria officinalis*.

But notwithstanding these variations, showing that the only character by which the two genera are kept apart is the linear stigma, I have finally determined to adopt the genus, mainly on the ground assigned by Mr. Bennett, "well marked peculiarity of habit and geographical distribution," as by so doing I will be enabled to present a comparatively complete enumeration of its species, which I could not do in the case of the undivided genus Parietaria, and should other Botanists feel disposed to take a different view and look upon Pouzolzia as a sub-genus, the following species can, as such, be easily incorporated with the larger group.

The habit, though so well marked that when once a few species are known, the others are for the most part easily recognized, presents, when closely examined, several very distinctive features, applicable to the division of the species into groups, well fitted to facilitate their discrimination. But for these, in a genus so extensive and upon the whole so natural, their determination must, in many cases, be very difficult.

Mr. Bennett, in his account of the genus, divides them into two groups, first, "Fructus bialatus. Folia (saltem inferiora) opposita;" and second, "Fructus sulcatus nec alatus. Folia plerumque omnia alterna," and even seems to think that they may form the elements of two distinct genera. A more extended acquaintance with the genus, shows that they are scarcely sufficient for the latter purpose, both being liable to exceptions as shown in plates 1979 and 80. I have therefore departed from that distribution and had recourse to the venation of the leaves, as the basis of my arrangement which, however, to this extent only, I look upon as natural.

My first group embraces all those having simply three-nerved or slightly triple-nerved leaves, that is, each nerve runs its whole course without conspicuous branches: the second, those with quintuple-nerved leaves, that is, those in which the middle nerve or proper costa gives off, generally near its middle, two conspicuous lateral branches and the lateral ones several others, but all on the outer side. To the first of these nearly all those with opposite and verticelled leaves appertain, to the second, all the alternate leaved ones, and a few with opposite leaves, are referable. There is a third form found in *P. cymosa*, but which I consider referable to the second group in which all the three primary nerves divide near the base, producing a many-nerved leaf, though not in the proper sense of that term. These two groups are respectively distinguished by other features, which show that they are truly natural, and might, perhaps with justice, be separated as distinct genera, but not certainly because the fruit of the latter are "sulcatus nec alatus" for, with the exception of *P. cymosa*, (probably a true Parietaria), they nearly all either produce 4 wings or show a tendency in that direction, by being 4-angled through the thickening of four of the veins which may be assumed either to be the costæ of 4 cohering sepals, or the lateral nerves of two; the last supposition seems the more probable as each extends considerably beyond the wings forming a kind of two-cleft beak, which is altogether wanting in the other group. Apart, therefore, from the 5-cleft involucre, they are more justly referable to Gaudichaud's genus *Thoumuria* than to *Pouzolzia*. My own impression is that the two groups are not true congeners, and might with propriety be respectively raised to the rank of genera. I am, however, adverse to this proceeding, because I think the already existing genera of this order are, if not too numerous, at all events too loosely defined to be maintained as they now stand, and that, therefore, were I to add another it might merely be adding to the already existing confusion, owing to my imperfect acquaintance with the rest of the order, and in the meantime all the Indian species can be easily enough ranged under Mr. Bennett's character. Of the numerous real or supposed species, defined in the following pages, I already begin to entertain doubts of their all proving permanent, and suspect, that if leisure permitted me to go over the ground again with the same attention that I bestowed six months ago, I should probably find occasion to reduce some of them, having in the interval obtained additional specimens of some which may probably, by throwing further light on such as were then obscure, show that my first determination was premature. This, however, is now quite impossible, I can, therefore, only express a hope that my fears on this account may prove groundless. They principally appertain to those having wingless fruit and verticelled leaves, my more extended acquaintance with plants of this genus having shown me that some, indeed many of those having winged fruit, when full grown, have wingless ones in the lower fascicles, hence the probability that some of those described as having wingless fruit, may be merely junior specimens in which perfectly developed ones may not yet have been produced, and in regard to the leaves, I have repeatedly, since this paper was written, found opposite and verticelled leaves on the same plant, lowering by so much the value of that character when not well supported by others more constant. These facts I think it necessary to mention, to put others on their guard against placing too much reliance on those marks of distinction, as well as to warn collectors to be always careful in selecting their specimens. For exhibiting the fructification the most fully developed branches either in whole or in part should be taken, that is, in case, as often happens, the floriferous portion has grown to so great a length as to make a specimen, having both leaves and fruit inconveniently large, to be sure always to add to a smaller and younger branch a part of one fully developed, for in full-grown specimens it is occasionally found that male flowers have, at the extremities, almost entirely given place to female ones, all of which are winged while on younger branches of the same plant they are nearly as universally males, or if fruit are found they are wingless, and concealed among the males. A knowledge of this fact may occasionally save trouble, and remove uncertainty in the determination of a species.

The number of stamens is also sometimes variable, but less so than the foliage and forms of the fruit.

In regard to the accompanying figures I fear some of them will not be found so useful as I at first anticipated, for owing to want of room they often fail in conveying a correct idea of the habit, a point on which native artists are apt to fail, their drawings being usually deficient in ease, but so far as correct outline can compensate for deficiency of grace, I believe the accompanying may generally be depended on. The analyses are true to the specimens from which the subjects were taken, but as these are so much alike throughout they may not prove so useful as might, a priori, have been expected. This, however, is a point which remains to be ascertained.

With these brief memoranda, explanatory of the principles which guided me in the construction of the following Clavis and characters of the species, I bring this hurried and imperfect monograph to a close, together with the work of which it forms a part, not however without expressing the hope that the latter may prove the means of inducing new inquirers to enter this extensive field of research, by lightening the labour of gathering and storing the rich harvest that still remains to be reaped. So rich indeed is the Indian Flora that, did circumstances permit, I could here, in Coimbatore, with the materials readily within my reach, commence a new series, and without reproducing a single species already introduced, carry on the work, I believe, through other 2000 plates.

Pouzolzia. (Gaud., Bennett.)

Gen. Char. Flowers monoicous, rarely dioicous. Male. Perianth 4–5- rarely 3-parted, stamens 4–5, rarely 3: rudimentary pistil minute or wanting. Female. Perianth tubular, contracted at the apex, persistent, enclosing the seed or nut: at maturity sulcately ribbed or 2–3–4-winged, bidentate at the apex. Style short or none: stigma prolonged, filiform, glandulose on one side. Nut ovate, crustaceous, fragile. Seed erect, rather sparingly albuminous. Embryo axile, inverse; radicle cylindrical, remote from the hilum.

Herbaceous, suffruticose or shrubby plants: creeping, procumbent, ascending or erect. Leaves ternately verticelled, opposite or alternate, entire or rarely serrated, 3-nerved, or triple or quintriple-nerved: variously pilose, very rarely glabrous. Flowers axillary, glomerate, short pedicelled. Clusters at first nearly all males mixed with a few sessile, ovate, ribbed, wingless fruit, afterwards, towards the ends of the floriferous branches, the male flowers diminish in number and are replaced by female ones producing winged fruit.

Obs. The term *Fruit*, as here applied, is meant to include the nut or achænium together with its enclosing perianth, as seen when it separates at maturity from the parent plant.

Obs. I have said above that the lower glomerules are made up of male flowers mixed with "wingless fruit" *not female* flowers. This is strictly correct, the female flowers precede the males and are besides so small that they are nearly invisible until they have attained an advanced state of maturity, while a succession of male flowers continue opening for a length of time and before they have all passed away the first seed are mature and dropping off.

This fact, which I have often observed, leads me to suspect that most, if not all Mr. Bennett's supposed dioicous species, are monoicous, but the specimens young and the sessile fruit concealed among the pedicelled male flowers. It is not until long after, that the winged fruit, which are mainly confined to the extremities of the floriferous branches, are fully developed.

Clavis of the Species.

1	Leaves 3–5-nerved, ...	2		
	——— quintuple- or triplici-nerved, ...	32		
2	Leaves all similar, upper ones sub-equal or somewhat reduced in size, ...	3		
	——— upper ones much reduced, often bract-like, ...	18		
3	Leaves, at least the lower ones, opposite, ...	4		
	——— Whorld in threes, ...	11		
4	Stems erect or ascending, ...	5		
	——— procumbent, diffuse, 3–4-androus, ...		PARVIFOLIA,	1
5	Flowers 4-androus, ...	6		
	——— 5-androus, ...	9		
6	Fruit ovate, ribbed, wingless, ...	7		
	——— in the upper axils winged, ...	8		
7	Leaves sessile, broad sub-cordate at the base, tapering to a point, smooth, ...		INTEGRIFOLIA, *Icon.*	1979
	Leaves short petioled, cordato-lanceolate acute, slightly scabrous above,		ACUTA,	2
8	Leaves sub-sessile, cordate, linear lanceolate acute, glabrous above, pubescent beneath,		AMBIGUA,	19
9	Fruit winged: leaves nearly oval, shortly, and somewhat abruptly, acuminate,		OVALIFOLIA,	3
	——— not winged,	10		
10	Leaves broadly oval, obtuse at the base, acuminate, pilose on both sides,		MYSORENSIS,	4
	——— short petioled, oblong lanceolate, with a longish slender acumen,		GARDNERI,	5
11	Flowers pentandrous, ...	12		
	——— tetrandrous, ...	15		
12	Fruit winged and ribbed in the same glomerules, ...	13		
	——— not winged, stem and under surface of the leaves tomentose: leaves linear lanceolate,		TOMENTOSA,	11
13	Fruit 4-winged, leaves sessile, lanceolate, villous beneath, sometimes opposite,		QUADRIALATA,	12
	——— two-winged,	14		
14	Leaves sub-pubescent or glabrous, smooth above, narrow lanceolate, acute at both ends, fruit ovate and broadly 2-winged,		HETEROCARPA,	13–14
	——— scabrous above, villous beneath; ovate lanceolate sub-cordate: fruit 2-winged,		BENNETTIANA, *Icon.*	1978
15	Leaves all similar, upper ones only slightly reduced in size,	16		
	——— upper ones conspicuously reduced in size, and more or less altered in form,	17		
16	Leaves lanceolate acuminate; pilose above, villous beneath,		TERNATA,	7
	——— sub-cordate, long linear lanceolate; slightly downy on both sides,		LONGIFOLIA,	6
17	Leaves narrow linear lanceolate, velvety beneath, upper ones much reduced in size,		WIGHTII,	8
	——— elliptico-lanceolate acute, pubescent beneath, rough above, upper ones cordate,		CONCINNA,	9

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18	Leaves opposite, ...	19		
	——— ternate, sessile, very rough, flowers 4-androus, ...		ASPERA,	18
19	Flowers pentandrous, ...	20		
	——— tetrandrous, ...	25		
20	Upper leaves reduced in size, scarcely altered in form, ...	21		
	——— reduced in size and conspicuously altered in form, ...	22		
21	Stem very ramous, 4-angled, leaves sub-sessile, narrow lanceolate cordate, pubescent beneath,		PENTANDRA,	20
	Sparingly branched: leaves ovato-lanceolate acute, pilose on both sides, coriaceous, scabrous,		WALKERIANA,	16
22	Fruit often 3-winged; leaves short oval or cordate, ovate, prickly hispid on the margin,	23		
	——— 2-winged: leaves long linear lanceolate, glabrous, except a line of hairs on the margin,		GLABRA,	15
23	Stems very ramous, straggling or climbing among bushes,	24		
	——— procumbent: middle wing of the fruit often thickened or spongy,		DALZELLII,	21
24	Stem very ramous: leaves hispid on the margin, sessile, cordate: middle wing of the fruit sometimes thicker than the others,		RAMOSISSIMA,	17-28
	——— ramous; leaves oval short-petioled, glabrous except the margin, floral ones linear acute, ...		STOCKSII,	
25	Upper leaves much reduced in size, cordate, ...	26		
	——— ovate or sub-cordate lanceolate, ...	28		
26	Leaves sparingly pilose, roughish above, ...	27		
	——— tomentose beneath, hispid above, ...		SCABRA,	29
27	Leaves sessile, sub-cordato-truncate, oblong lanceolate, acute, glabrous; floral ones very small,		CAUDATA,	27
	——— ovate lanceolate, acuminate, slightly hispid: fruit orbicular, deeply cordate, ...		COURTALLENSIS,	10
28	Leaves scabrous above, villous beneath, ...	29		
	——— hispid towards the margin, smoother on the disk, ...	31		
29	Fruit wingless, ...	30		
	——— ribbed and winged, leaves ovate lanceolate sub-falcate: stem terete, pubescent,		NEILGHERRENSIS,	26
30	Leaves short, broad ovate, rounded at the base, acute, stem roughly tomentose: floral leaves lanceolate,		OVATA,	24
	——— ovate oblong lanceolate, roundish or sub-cordate at the base: floral leaves narrow lanceolate,		OBLONGIFOLIA,	25
31	Leaves lanceolate acuminate, tapering at both ends, upper ones narrow lanceolate, fruit wingless,		WALLICHIANA,	23
	——— ovate lanceolate acuminate, fruit 3-winged or simply ribbed,		TRIALATA,	22
32	Leaves opposite tripilici-nerved, i. e., all the three primary nerves branched (some of them are somewhat 5-nerved at the base),	33		
	——— usually alternate quintuple-nerved, i. e., the middle primary nerve twice branched: (the lateral ones are secundly branched), ...	34		
33	Inflorescence cymose fruit sessile, wingless, ...		CYMOSA, *Icon.* 1979	
	——— glomerulate, sessile: fruit imperfectly winged, ...		MICROPHYLLA,	30
34	Male flowers pentandrous, ...	35		
	——— tetrandrous, ...	43		
35	Fruit wingless, leaves alternate, ...	36		
	——— 4-angled more or less perfectly, 4-winged; leaves sometimes opposite,	38		
36	Leaves lanceolate acute at both ends, ...	37		
	——— broadly ovate at the base or sub-orbicular, ...		ROTUNDIFOLIA,	31
37	Leaves elliptic, hispid above, pubescent beneath, fruit ovate slightly ribbed,		ELLIPTICA,	32
	——— broad ovato- lanceolate, smooth above, downy beneath, fruit somewhat compressed with a thickened margin,		BICUSPIDATA,	33
38	Fruit imperfectly 4-winged, calyx prolonged into a short beak or apiculus,	39		
	——— distinctly 4-winged, beaked; leaves longish petioled, broad ovate, membranous,		ROSTRATA,	34
39	Procumbent, diffuse: leaves opposite or sub-alternate, subsessile,	40		
	Erect or ascending: leaves alternate, petioled, elliptico-lanceolate or ovate,	41		
40	Leaves crowded, alternate, ovate, bluntish, pilose, small: fruit deeply furrowed,		PROCUMBENS,	35
	——— opposite broadly ovate sub acute, pilose; fruit prominently ribbed and imperfectly winged,		DIFFUSA,	36
41	Fruit imperfectly 4-winged; wings truncated,	42		
	———winged, wings sub-orbicular, enlarging above, auricle-like,		AURICULATA,	37
42	Leaves ovate or ovato-lanceolate obtuse, rounded at the base, ramous,		RHEEDII,	38
	——— subtriplici-nerved, lanceolate, acute at both ends, at first nearly smooth, becoming scabrous, villous beneath, ...		SCABRIDA,	41
43	Leaves entire on the margin, ...	44		
	——— serrated, shrubby, ...		BORBONICA,	44
44	Leaves alternate, ...	45		
	——— opposite, at least the lower ones, ...	50		
45	Fruit ribbed or deeply furrowed, not winged, ...	46		
	——— four-winged: procumbent, diffuse, leaves sub-sessile, ovate, pilose small,		MINOR,	43

46	Fruit prominently ribbed,	47		
	——— even or only slightly ribbed,	49		
47	Lateral ridges thicker (perhaps sometimes enlarging into wings,	48		
	Ridges nearly all equal (10), leaves narrow linear, somewhat strap-shaped,		ANGUSTIFOLIA,	39
48	Leaves all similar, ovato-lanceolate, pilose on both sides, very branchy,		INDICA?	40
	Lower leaves ovate lanceolate, upper ones narrow linear lanceolate subcordate,		SUFFRUTICOSA,	
49	Leaves ovate acute, hairy, much broader at the base, root tuberous,		TUBEROSA,	
	——— broad lanceolate, acute at both ends, petioled, several inflated vesicles at the base of the fruit,		VESICARIA,	
50	Fruit ovate, ribbed or broadly 4-winged,	51		
	——— ovate, compressed, ribbed or moderately winged: leaves all opposite, long petioled,		ZEYLANICA,	45
51	Stems decumbent, leaves nearly all opposite, ovate, obtuse, moderately petioled,	52		
	——— Erect or ascending: leaves mostly alternate, much reduced in size towards the apex,	53		
52	Stems stoutish, leaves short petioled, fruit largely apiculate,		PILOSA,	46
	——— slender filiform, petiols longish very slender, upper leaves scarcely reduced,		JOHNSONIANA,	47
53	Stems erect or ascending, ramous, leaves longish petioled, membranous, —		TETRAPTERA,	42
	——— long straight, lower branches opposite: leaves alternate, short petioled, upper ones sessile small,		PYRAMIDATA,	48

N. B.—The outer row of figures refer to the number of the species in the accompanying plates.

I.—Leaves simply three-nerved: nerves undivided.

§ 1.† Male flowers 3-androus, fruit not winged.

1. *P. parvifolia* (R. W., fig. 1) procumbent, diffuse, pubescent: leaves opposite, ovate, or suborbicular: flowers few, axillary, short pedicelled; males triandrous: female ovate slightly ribbed.

Ceylon, Thwaites. This species is easily distinguished by being 3-androus, which I have found constant in five or six flowers examined, it agrees however in all other respects with the character of the genus, and need not on that account be removed from it. Leaves 4–6 lines long and nearly the same breadth.

§ 2. Male flowers 4-androus.

2. *P. integrifolia* (Dalzell, Hooker, Kew Gard. Miscellany, Ic. 1979), leaves opposite, sessile, subcordate, broadest at the base, thence tapering uniformly to the point, sub-acuminate, united by a broad stipule, sparingly pilose on both sides; roughish above: flowers axillary, subsessile: males tetrandrous or sometimes 3-androus: fruit 2–3-winged: wings ciliate.

Mountains, Malabar, flowering September. The stipules in this species are more distinct than usual, completely connecting the opposite leaves.

I am indebted to Mr. Dalzell for the specimen represented, and from which this character is taken.

3. *P. acuta* (R. W. 2), erect, sparingly ramous; leaves sessile, subcordate, lanceolate, acuminate; subscabrous above, slightly hoary on the nerves beneath: stipules deciduous: flowers axillary, subsessile, 4-androus: fruit both winged and ribbed: winged ones broad cordate at the base, bicuspidate at the apex; ribbed ones simply ovate.

Courtallum, flowering July and August.

§ 3. Flowers pentandrous.

4. *P. ovalifolia* (R. W. 3), somewhat diffuse, ascending, or seeking support: leaves subsessile or very shortly petioled, oval; acutish at the base, sharply acuminate; pilose on both sides, scabrous above: stipules ovate, deciduous: flowers 5-androus, fruit ovate or slightly cordate at the base, ciliate at the apex.—The leaves in the figure are rather more ovate than on the specimen.

Alpine jungles. So far as my specimens show, all the leaves of this species are opposite, and nearly oval except the short acumen.

5. *P. Mysorensis* (R. W. 4), erect, glabrous: leaves short petioled, oblong lanceolate, obtuse or subcordate at the base, acuminate at the apex; smooth above, glabrous or slightly pilose on both sides, ciliate on the margin: flowers pentandrous, fruit ribbed, not? winged.

Narri Bolu, of the Mysorians.

Bababooden Hills, Mysore, Bertie, flowering December. I am uncertain in regard to the fruit, as it is probable that the absence of winged ones may be owing to want of maturity of the specimens, but as this rests on conjecture only, I am constrained to notice that character, which may in truth be a valuable one.

6. *P. ambigua* (R. W. 19), stems erect, round, smooth, sparingly branched, pubescent towards the extremities: leaves sessile, subcordate, linear lanceolate acute, often slightly falcate; glabrous, rough above, somewhat velvety beneath, hispid on the margins; faintly 5-nerved, the outer pair almost inconspicuous; floral ones much reduced in size but similar: flowers axillary, glomerules compact; fruit ovate, ribbed, in the lower glomerules, above broadly winged, deeply cordate at the base.

Courtallum, Malabar, flowering during the rains. This species so far resembles the figures of P. *pentandra*, that previous to examination I considered it that species, and even now feel almost disposed to look on it as a 4-androus variety of that species, hence the specific name, which I have given, refers not to any ambiguity of the genus to which the plant belongs but the species, that is, I am uncertain whether it is a species or variety.

7. *P. Gardneriana* (R. W. 5), erect, somewhat ramous, stem and branches terete, sub-glabrous: leaves short petioled or subsessile, broadly oval, obtuse at the base, acuminate, acute at the apex, pilose on both sides: flowers few, sessile, pentandrous; fruit wingless.

Ceylon. Gardner, Thwaites. Though in character very similar to the preceding, this is a very distinct

species. It is not improbable that in old specimens winged fruit may be found.

§ 4. **Leaves ternately verticelled: flowers pentandrous,—upper leaves conformable or simply reduced in size.**

8. *P. tomentosa* (R. W. 11), stem and under surface of the leaves tomentose: leaves sessile, ternately verticelled, oblong, ovate-lanceolate, rounded or sub-cordate at the base, acute or sub-acuminate; scabrous above: stipules reflexed: flowers numerous, pentandrous, subsessile: fruit wingless, ribbed.

Neilgherries, flowering August and September. I find no trace of wings in this species, though the specimens seem to have attained an advanced state of maturity, but still I cannot feel certain on this point as male flowers so greatly predominate, which seems to indicate that they are still far from maturity.

9. *P. heterocarpa* (R. W. 13, 14), erect, sparingly branched, stems terete, glabrous: leaves ternately verticelled, triple-nerved, short petioled, narrow lanceolate, acuminate at both ends; smooth, downy above, hoary beneath: flowers numerous, sessile, pentandrous: fruit varying from slightly ribbed to broadly winged, the winged ones deeply cordate at the base.

Western slopes, Neilgherries, flowering December. I have two forms of this plant the one here described clothed with short pubescence, the other glabrous, but both free from roughness on the surface: the leaves are from 3 to 5 inches long and about ¾ of an inch broad, ending in a long tapering acumen.

This being among the first examined in which I found two forms of seed, I named it accordingly; the discovery of so many others similarly circumstanced has rendered it less appropriate.

10. *P. Bennettiana* (R. W., Ic. 1978), erect, sparingly branched: stem and upper surface of the leaves scabrous: leaves ternate, short petioled, ovate lanceolate, slightly unequal-sided, obtuse or sub-cordate at the base, ending in a long tapering acumen; pilose above, densely pubescent or sub-tomentose, especially on the nerves, beneath: flowers numerous, subsessile, 5-androus: fruit in the same fascicles ovate, simply ribbed, or broadly two or three winged; the two winged ones rather deeply cordate at the base.

Neilgherries, Ceylon? Courtallum?

I feel still uncertain whether to view this simply as a variable plant or to suppose that I have combined more than one species. The form represented in the plate is that which I consider the true one, all except the winged fruit which was taken from too young a specimen and had not attained its perfect form. Among the forms I have referred here, are some with much narrower and more tomentose leaves, but all agreeing in their scabrous upper surface. The Ceylon and Courtallum plants differ in the above respects from the Neilgherry ones. The slight inequality of their sides, gives the leaves a somewhat falcate appearance which is readily observable in the specimen, though scarcely shown in the figure.

§ 5. **Leaves ternately verticelled: flowers 4-androus.**

* **Upper leaves reduced, not bract-like.**

11. *P. ternata* (Bennett, 7), erect, sparingly branched; stem and under surface of the leaves hoary: leaves all alike, but smaller towards the extremity, subsessile, broadest and slightly cordate at the base, lanceolate, acute; pilose above, somewhat tomentose beneath: flowers 4-androus, fruit winged or simply ovate, ribbed.

Courtallum. This principally differs from the two preceding species in being tetrandrous, a distinction which I think it probable more extended acquaintance with these species will show to be of scarcely specific value. Among the specimens I have referred to *Bennettiana*, perhaps erroneously, I find some with tetrandrous flowers, but I have not met with pentandrous ones on this.

12. *P. longifolia* (R. W., 6), erect, stem 4-angled, scarcely branched: clothed with rough hairs: leaves ternate, subsessile, linear lanceolate, broadest, and sub-cordate at the base, taperingly acuminate at the apex; pilose on both sides, scabrous above, the under-surface netted with dark coloured somewhat prominent veins: fascicles few-flowered, flowers tetrandrous, fruit broadly winged and deeply cordate.

Courtallum, September. Leaves about 6 or 7 inches long and scarcely 1 broad, membranous, the hairs with which their surface is thickly clothed so fine that until closely examined they look as if glabrous.

13. *P. Wightii* (Bennett, 8), erect, scarcely branched, terete: leaves sessile, opposite or ternate; narrow linear lanceolate; tomentose beneath, downy and slightly rough above, the extreme ones considerably smaller: flowers 4-androus: fruit broadly winged, ciliate, cordate at the base, somewhat forked at the apex.

Pulney Mountains, September.

This is a very distinct species from the preceding, but very nearly approaches *ternata*, in every thing except the great diminution in size of the floral leaves which, however, I esteem a good character.

14. *P. concinna* (R. W., 9), erect, terete, glabrous, leaves opposite and ternate, sessile, lanceolate, spreading, acuminate, the extreme ones much smaller and cordate, acute, all downy on the nerves beneath and scabrous above; flowers tetrandrous, axillary, sessile, few: calyx lobes lanceolate acute: fruit both ovate and winged.

Courtallum. The leaves in this species are spreading, rather rigid, below exactly lanceolate, but somewhat prolonged at the point into a fine acumen, towards the extremities of the older branches, short, broad ovate cordate. It is a neat pretty looking plant in the herbarium, whence the specific name.

* * **Upper leaves bract-like.**

15. *P. aspira* (R. W., 18), erect, very ramous, the terminal shoot long and slender; stem and branches terete, very rough: leaves ternate rarely opposite, sessile, broad ovate-cordate, acute, 5-nerved at the base; rough on both sides but especially above; those on the floriferous ramuli much reduced, often almost to mere scales, cordate acute: flowers 4-androus, fruit all ovate, ribbed, not winged.

Anamallay Hills; flowering in July. One of the most marked species of the genus; distinguished by its rigid numerous harsh broadly ovate cordate leaves, its slender floriferous axillary ramuli, the terminal one sometimes from 12 to 18 inches long: fruit very small, numerous, ovate, and ribbed throughout.

§ 6. **Leaves opposite, upper ones much reduced in size or bract-like.**

† **Flowers pentandrous.**

16. *P. pentandra* (Bennett, Ico. 696, *Urtica pentandra*, Roxb.), stem ramous, 4-sided towards the apex: leaves sessile, narrow lanceolate, cordate, pilose on both sides, scabrous above; upper ones reduced in size but similar in form: flowers pentandrous: fruit winged, cordate.

Calcutta, Roxburgh. Java, Bennett.

17. *P. Walkeriana* (R. W., 16), erect, sparingly ramous: leaves short petioled, lanceolate, narrow or acute at the base, pilose on both sides, scarcely scabrous, ciliate on the margin; upper floral ones narrow lanceolate, sessile, sub-cordate: flowers pentandrous: fruit winged, without intermediate ribs.

Ceylon, Col. Walker. This species is very near *pentandra*, which indeed I at first considered it, until more careful examination enabled me to detect my error.

18. *P. Stocksii*, (R. W., 28–20 ?) straggling ramous, seeking support and then ascending; stem and branches four-angled, furrowed between, glabrous: petiols short, connected by a broad scarious stipule: leaves glabrous except the hispid margin, from oval obtuse at both ends to cordato-ovate obtuse; floral ones sessile, narrow ovato-lanceolate obtuse; flowers few, axillary, pentandrous, fruit ovate, ribbed or broadly two or sometimes three-winged.

Coimbatore, Anamally forests, Belgaum ? Dalzell; Deccan, Stocks.

The three specimens, thus associated, all differ but yet possess so much in common that I see no other alternative for the present than that of uniting them until more perfect ones of the two last are obtained.

Mr. Dalzell's specimen is a branch of a young plant not yet properly in fruit, Dr. Stocks' of a loose straggling one which he found growing in the bed of a river and probably much modified in its mode of growth by the locality, as its leaves are alternate! though so distinctly appertaining to the opposite-leaved group. If other specimens of this last are found constant in regard to the alternate leaves it will form a very distinct species. Until that is ascertained it seems more closely to resemble my plant than any other I have seen. Mr. Dalzell describes his as being quite erect, but then it is only half-grown and may, when further advanced, show the straggling habit of mine with which in other respects it seems to associate.

19. *P. ramosissima* (R. W. 17), erect, very ramous, branches ascending, hispid: leaves subsessile, ovate cordate obtuse, sparingly pubescent above, glabrous beneath except the margin which is hispid; upper ones much reduced, sessile, varying from broad deeply cordate to ovato-lanceolate: flowers pentandrous, fruit 2–3-winged, prominently ribbed between the wings.

Neilgherries. My specimens of this plant are not very satisfactory as they seem to have been injured or grew under unfavourable circumstances as, in one, the stems are erect and the branches all reflexed and drooping, while in another they are cernuous: the latter had been injured in its primary shoot and thence gave off numerous laterals. The form however of the leaves, their small size, about an inch long, their glabrous surfaces and hispid margins, leaves no doubt of this being a very distinct species.

20. *P. glabra* (R. W. 15), stems erect, sparingly branched, glabrous, terete: leaves long lanceolate, acute at both ends, triple-nerved, glabrous on the disk, hispid on the margin: upper ones much reduced in size, ovate cordate, acute: flowers pentandrous, sessile: fruit broadly winged with intermediate prominent ridges.

21. *P. Dalzellii* (R. W. 21), procumbent, glabrous: leaves subsessile, from ovate to sub-cordato-ovate, acute, glabrous except a line of prickly hairs on the margin; floral leaves small, sessile, broad cordate at the base, acute: flowers axillary, few, pentandrous: fruit ovate, broadly ribbed or winged, furnished between with a thick spongy protuberance.

Canara, Dalzell.

These three species are all very like each other. The two first, *ramosissima* and *Stocksii*, may even require to be united, the last is I think quite distinct. The spongy protuberance on the back of the fruit between the wings, a sort of third very thick wing, is quite peculiar. I have attempted, though not very successfully, to show it in the transverse section.

Ceylon, Thwaites. This seems, so far as can be made out from a single specimen and that somewhat injured by insects, a very distinct species, resembling, however to some extent, both in habit and outline of the foliage, *P. Walkeri*, though otherwise very different.

* * Flowers tetrandrous.

22. *P. scabra* (R. W. 29), erect, scarcely branched, stems terete, glabrous: lower leaves short petioled, ovate obtuse at the base, pointed; scabrous above, roughly pilose beneath, floriferous portion long and slender with minute bract-like sessile cordate leaves: fascicles few-flowered: flowers tetrandrous, fruit winged, inconspicuously ribbed between.

Anamallay Mountains, July and August. A very marked species, approaching *P. aspera* in some of its features.

23. *P. caudata* (Bennett, 27), erect, ramous; stems terete, glabrous: leaves sessile, sub-cordato-truncate at the base, lanceolate acute or acuminate, membranous; smooth and glabrous on both sides: floriferous shoots slender with minute bract-like, cordate, acute, leaves: flowers tetrandrous: fruit simply ovate, ribbed and winged in the same fascicles.

Courtallum and Anamally Mountains, flowering September.

24. *P. Wallichiana* (R. W. 23), fruticose, erect, branches terete, pubescent: leaves short petioled, lanceolate, obtuse at the base, tapering above to a slender point, hispid on the margin, otherwise nearly glabrous above, velvety beneath; floriferous ones narrow lanceolate, much reduced in size: flowers tetrandrous; fruit ovate, ribbed, wingless.

Neilgherries and Iyamally Hills, near Coimbatore. This is one of the largest species I have seen, some plants I met with on the Neilgherries having attained a height of 10 or 12 feet, quite shrubby, but seeking the support of the surrounding dense arboreous jungle.

25. *P. ovata* (R. W. 24), erect, sparingly branched, stems pubescent or somewhat hoary: leaves short petioled, broad ovate, acute, rigid, very scabrous above somewhat hoary beneath, hispid on the margin: floral leaves much smaller but scarcely changed in form: flowers tetrandrous, sessile: fruit ovate, wingless.

Iyamally Hills. This is nearly allied to the preceding, but is certainly distinct. In this the largest

I.

leaves are from $1\frac{1}{2}$ to 2 inches long by from 1 to $1\frac{1}{2}$ broad; in that they are from 4 to 6 inches long, by about 1 or $1\frac{1}{2}$ broad; in this they are very scabrous in that nearly smooth. In both, so far as the specimens show, the fruit are wingless.

26. *P. Neilgherrensis* (R. W. 26), erect, sparingly ramous; stems terete, scabrous: leaves petioled, lanceolate, obtuse at the base, tapering to a point, acute, lower ones slightly falcate; softly pubescent beneath, harshly scabrous above; floriferous ones alternate, much reduced in size and becoming broadly ovate cordate towards the ends of the spikes: flowers tetrandrous, fruit on the lower portions of the spikes all ovate, ribbed; towards the apex, winged and ovate, mixed.

Neilgherries, Kotergherry pass, abundant.

My specimens of this plant show well the necessity of selecting them well advanced, as otherwise they are apt to mislead, some of them presenting none but ovate ribbed fruit, while others, somewhat older, have abundance of winged ones.

27. *P. oblongifolia* (R. W. 25), erect, sparingly ramous, scabrous: leaves oblong lanceolate, roundish or sub-cordate at the base, sub-sessile; scabrous above, villous beneath; floriferous ones much reduced in size, sessile, narrow lanceolate, acute: tetrandrous, fruit ovate, rigid, wingless.

Iyamally Hills. I for some time hesitated whether I ought not rather to view this as a long leaved variety of *ovata* than a species, they, however, seem distinct. Leaves 4 to $4\frac{1}{2}$ inches long by about $1\frac{1}{2}$ broad

28. *P. trialata* (R. W. 22), erect, scarcely branched; stem terete, hispidly pubescent: leaves ovato-lanceolate, sub-acuminate, slightly unequal sided, hispid towards the margin, smooth on the disk, pubescent or slightly hoary beneath; floral ones smaller, but scarcely altered in form: flowers tetrandrous: fruit simply ovate and winged in the same fascicles, the latter 3-winged.

Iyamally, August, nearly allied to *P. Wallichiana*, but distinguished by its 3-winged fruit as well as by habit.

II. Leaves quintuple or rarely multuple-nerved, the lateral branches secundly branched.

§ 1. Leaves opposite, multuple-nerved, shrubby, erect, ramous.

29. *P. cymosa* (R. W. Ico. 1979), leaves sub-sessile, opposite, many-nerved, pubescent on both sides, male inflorescence cymose: cymes axillary, paired: flowers pentandrous, fruit sessile, one or two at the base of each peduncle, ribbed, not winged.

Neilgherries, Eastern slopes, flowering August and September.

This species is so unlike the rest of the group that I at one time thought of separating it as a distinct genus, a proceeding which may be deemed advisable when the whole order is fully revised in the event of its not finding a more suitable place in some of the already existing genera.

30. *P. microphylla* (R. W. 30), procumbent, diffuse, ramous: leaves sessile, broadly ovate cordate, obtuse; pubescent on both sides: flowers axillary, fascicled; sessile, tetrandrous: fruit 4-angled, or imperfectly 4-winged, with prominent intermediate ridges; sepals produced at the apex, forming a beak.

Hab. ——— ? The station is not recorded. It is only artificially related to the preceding by its opposite many-nerved leaves. In all other respects it associates better with some of the plants of the following section. Leaves 6–8 lines long 3–5 broad.

§ 2. Leaves alternate or rarely opposite, quintuple-nerved: fruit ovate, simply ribbed, 4-angled, or more or less perfectly 4-winged.

* Flowers pentandrous.

31. *P. rotundifolia* (R. W. 31), erect, sparingly branched, stems pubescent, obscurely 4-sided; sides furrowed: leaves alternate, long petioled, broadly ovate or sub-orbicular, pointed: flowers sessile, axillary, pentandrous: fruit few-ribbed.

Courtallum, flowering August and September.

My specimens seem to be males as there are very few fruit, perhaps in the female or on older branches, the fruit will be found to coincide with the more usual form in this group, that is, somewhat flattened with the angles prominent or even expanded into wings.

32. *P. elliptica* (R. W. 32), erect, ramous, pubescent; stems terete: leaves alternate, elliptic, acute at both ends, hoary beneath, roughish above: flowers axillary, sessile, pentandrous; females in the same fascicles: fruit ovate, even, or scarcely ribbed.

Malabar.

33. *P. bicuspidata* (R. W. 33), erect, sparingly ramous; stems terete, succulent: leaves alternate, long petioled, ovate lanceolate, acuminate: smooth above, pubescent beneath especially on the nerves: flowers glomerate, axillary ,sessile, pentandrous: fruit ovate, sub-compressed, sometimes margined, bicuspidate at the apex, not ribbed.

Courtallum, Ceylon, flowering August and September.

The lanceolate long acuminate leaves of this species, with its small glomerules of flowers, bring it near to *Paritaria Indica*, Lin., but its pentandrous flowers, and even, not sulcated, fruit sufficiently distinguish it; it also resembles the figure of Roxburgh's *U. visicaria*, from which its pentandrous flowers equally distinguish it.

34. *P. rostrata* (R. W. 34), erect, ramous, stems terete, glabrous: leaves long petioled, alternate, membranous, broad ovate, acuminate, glabrous on both sides: flowers glomerate, sessile; pentandrous: fruit broadly 4-winged, beaked.

Malabar. This is a peculiar and well-marked species not liable to be confounded with any other. Since the above was written I have received specimens from Canara, from Mr. Dalzell.

35. *P. procumbens* (R. W. 35), procumbent, rooting at the lower joints, ramous; branches ascending: leaves opposite, short petioled, oval, obtuse at both ends; pubescent beneath: flowers glomerate, axillary, pentandrous: fruit somewhat compressed, 4-angled; angles often thickened or produced into imperfect wings; apiculate or sub-rostrate.

Ceylon, Thwaites. My specimen of this plant is rather imperfect.

36. *P. auriculata* (R. W. 37), erect, ramous; branches terete, hoary towards the extremities: leaves alternate, longish petioled, lanceolate, acute at both ends; roughish above, pubescent beneath; flowers sessile, glomerate, pentandrous: fruit 4-winged; wings enlarging upwards, sub-orbicular above, auricle-like.

nate, near the base opposite: flowers glomerate, tetrandrous: fruit deeply furrowed or four-winged, with a large 2-cleft apiculus.

Malabar? The exact station is not given, but I think it is from Malabar. This species is readily distinguished by the fruit from all except the following, which it greatly resembles in that and some other respects, but is distinguished by the procumbent habit and more ovate leaves, the other being erect, with lanceolate ones.

48. *P. tetraptera* (R. W. 42), erect, or ascending, ramous, leaves membranous, pilose, nearly all alternate (a few of the lower pairs only opposite), longish petioled, elliptico-lanceolate, acute at both ends, or sometimes ovato-lanceolate, upper ones much smaller and narrower than the lower: flowers few, glomerate, axillary, sessile, tetrandrous: fruit in the lower axils prominently ribbed, in the upper ones usually broadly 4-winged.

Iyamallay and Bolamputty Hills, Coimbatore, flowering August and September.

Both these species are rather variable, but they seem to retain their respective habits and are no doubt quite distinct: though the fruit, which is peculiar, be the same in both.

49. *P. Johnsonana* (R. W. 47), decumbent, stems slender filiform, somewhat strigous: leaves longish petioled, pilose, alternate, from oval obtuse at both ends to ovato-lanceolate, sub-acute, floral ones reduced, petiols slender filiform: flowers few, axillary, sessile: males tetrandrous with a conspicuous rudimentary pistil, woolly at the base: fruit ovate, compressed, furrowed or broadly 4-winged and beaked.

Cochin, Malabar, Rev. E. Johnson. This seems a very distinct species, spreading flat on the ground, rooting for some distance round the root with floriferous extremities slightly ascending. The larger leaves scarcely exceed an inch in length and are about half as broad.

50. *P. pyramidata* (R. W. 48), straggling, ascending or erect, branches slender, 4-angled, rather deeply furrowed between; lower pairs opposite: leaves alternate or the first few pairs opposite, progressively diminishing in size from the base to the apex, where they almost disappear; lower ones short petioled, ovato-lanceolate; upper ones sessile, linear acute, all rough and sprinkled with a few longish adpressed hairs above and strigosely pilose beneath: stipules broad cordate, cuspidate: flowers few, axillary, sessile, tetrandrous: calyx fringed with long bristly hairs, rudimentary pistil woolly at the base: fruit ovate, furrowed or broadly 4-winged.

Quilon, Malabar. These two species are very unlike in appearance, though so nearly agreeing in the characters of the flower and fruit.

SPECIES UNKNOWN TO ME.

51. *P. hispida* (Bennett), dioicous, pentandrous: stem angled, pubescent: leaves subsessile, lanceolate cordate, rough above, glabrous beneath, glomerules densely flowered.

Nepaul, Wallich, Hamilton.

52. *P. quinquenervis* (Bennett), dioicous, pentandrous: stem scarcely branched, angled, smooth: leaves all similar, short petioled, ovato-lanceolate sub-acuminate, 5-nerved at the base, glabrous on both sides, male glomerules compact.

Nepaul, Hamilton.

53. *P. cordata* (Bennett), dioicous, pentandrous stem scarcely branched, angled, smooth: leaves all similar, subsessile, cordate acuminate, 5-nerved at the base; rough above, somewhat pilose on the veins beneath: male glomerules compact.

Java, Horsfield.

54. *P. prostrata* (Bennett), dioicous, tetrandrous, diffuse, stem-angled, somewhat hairy: leaves all nearly similar petioled, broad ovate obtusish, pilose above, pubescent on the veins beneath, male glomerules few-flowered.

Java, Horsfield.

55. *P. pauciflora* (Bennett), monoicous, tetrandrous; stem scarcely branched, angled, smoothish: leaves all similar, longish petioled, ovato-lanceolate, acute at the base, glabrous, glomerules few-flowered.

Parietaria bracteata, Wight, in Wall. list 4600, referred here by Bennett.

Pouzolzia parietarioides, Decaisne.

Parietaria sonneratii, Poir, seems, from the description, to be a species of *Elatostema.*

Parietaria Judiaca, according to Poir's description, is a species of *Forskalia.*

FINIS.

A. Ærva floribunda (R.W.) B. Pseudanthus brachiatus. (R.W.)

Dumphy Lith.

Govindoo, del. Dumphy, lith.

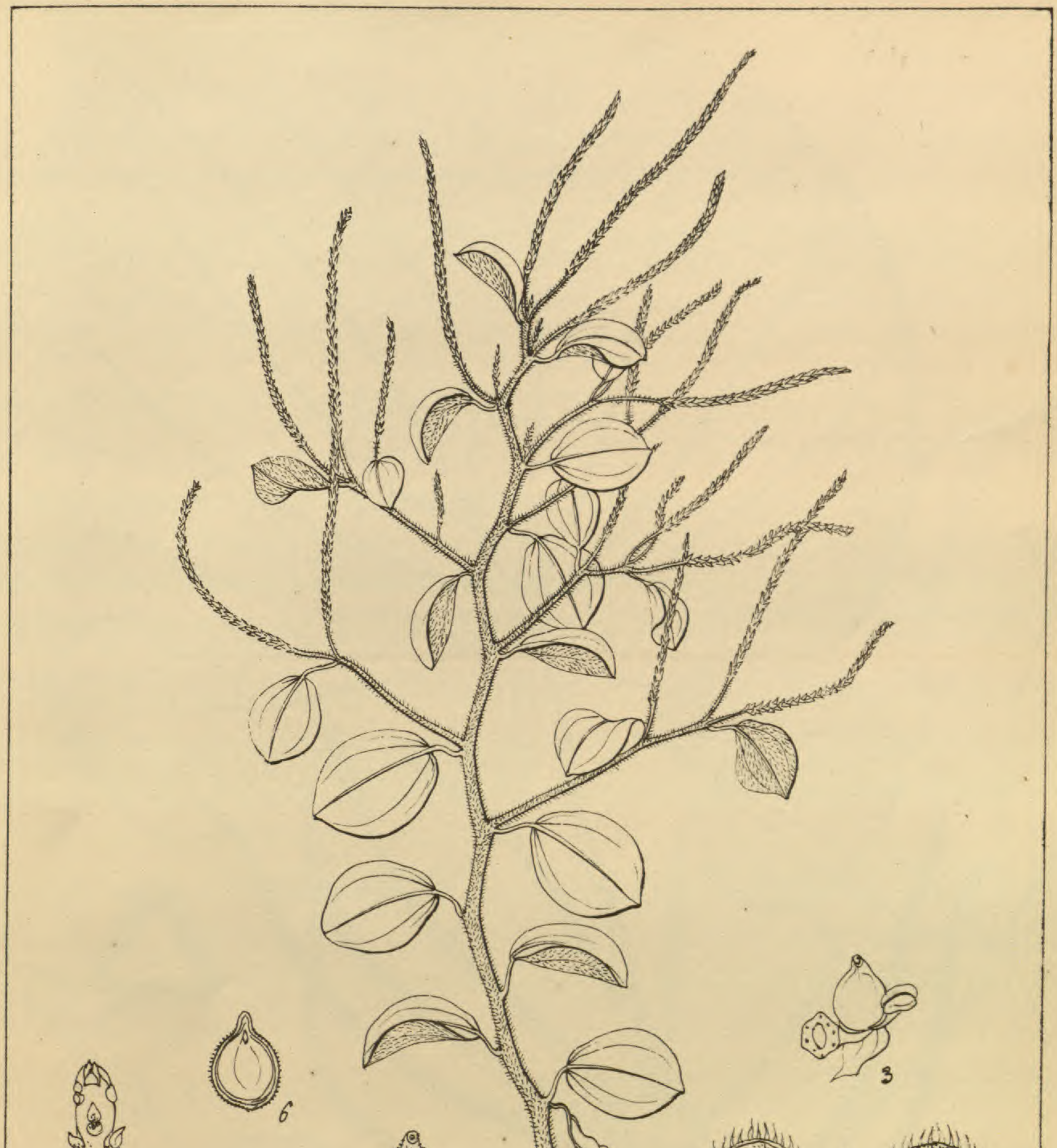
Peperomia Dindygulensis (Miq.)

Govindoo, del. Dumphy, lith.

Peperom. Heyneana (Miq) P. portulacoides (A. Dietr.)

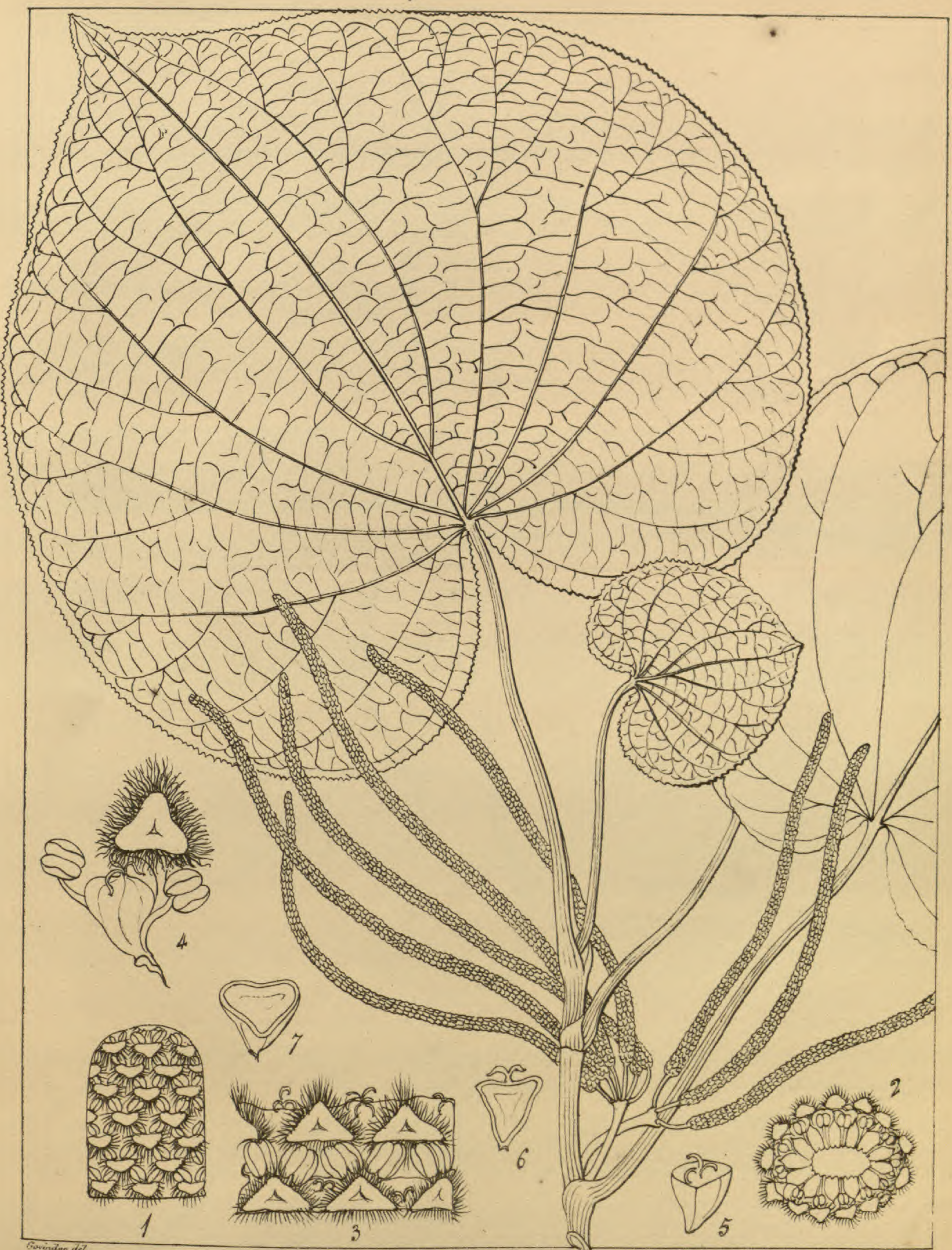
Govindoo, del. Dumphy, Lith.

Peperom: reflexa (A. Dietr) P. Courtallensis (Miq.)



Govindoo, del. Dumphy, Lith.

Peperomia Wightiana (Miq.)

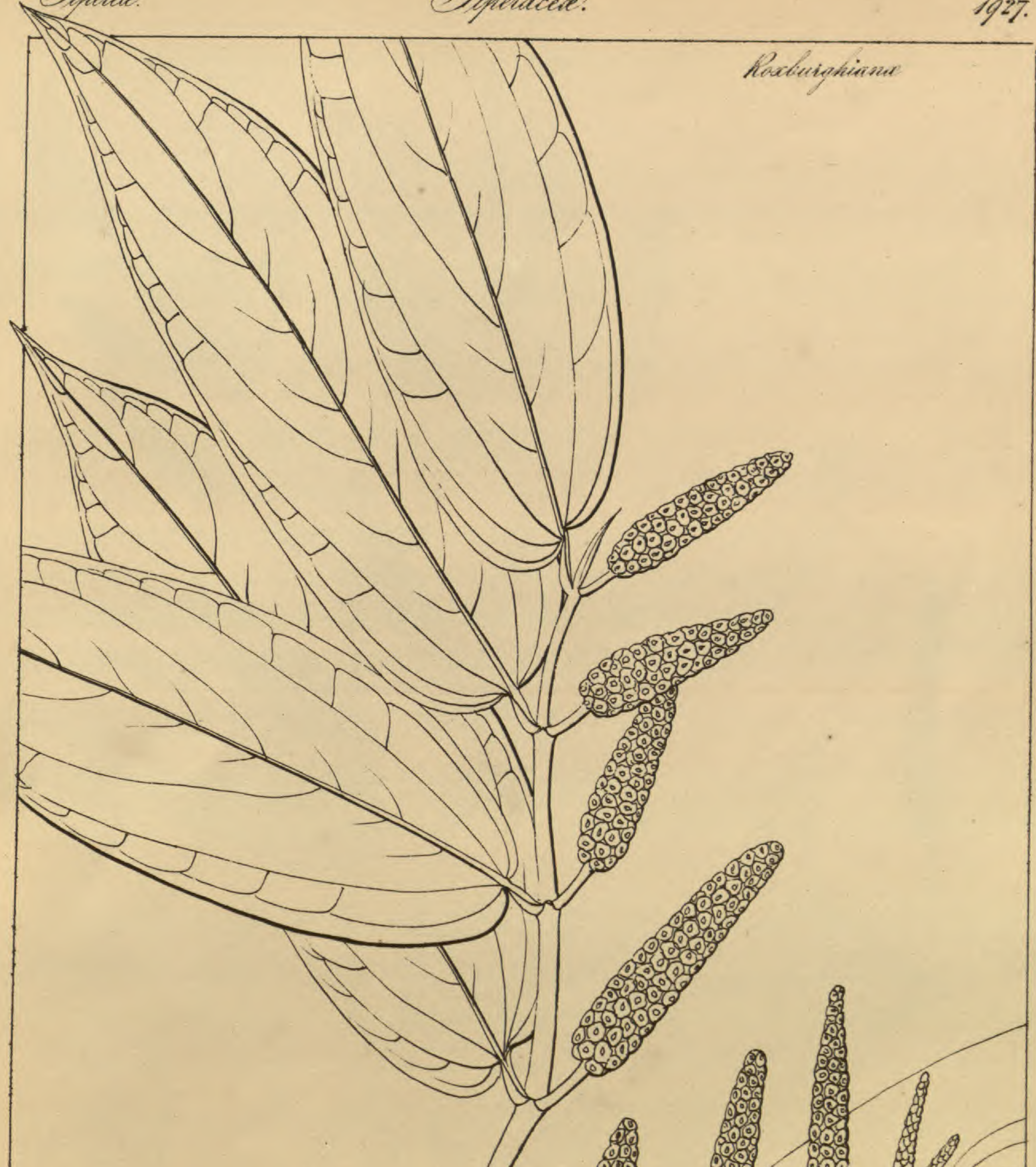


Govindoo, del. Dumphy, lith.

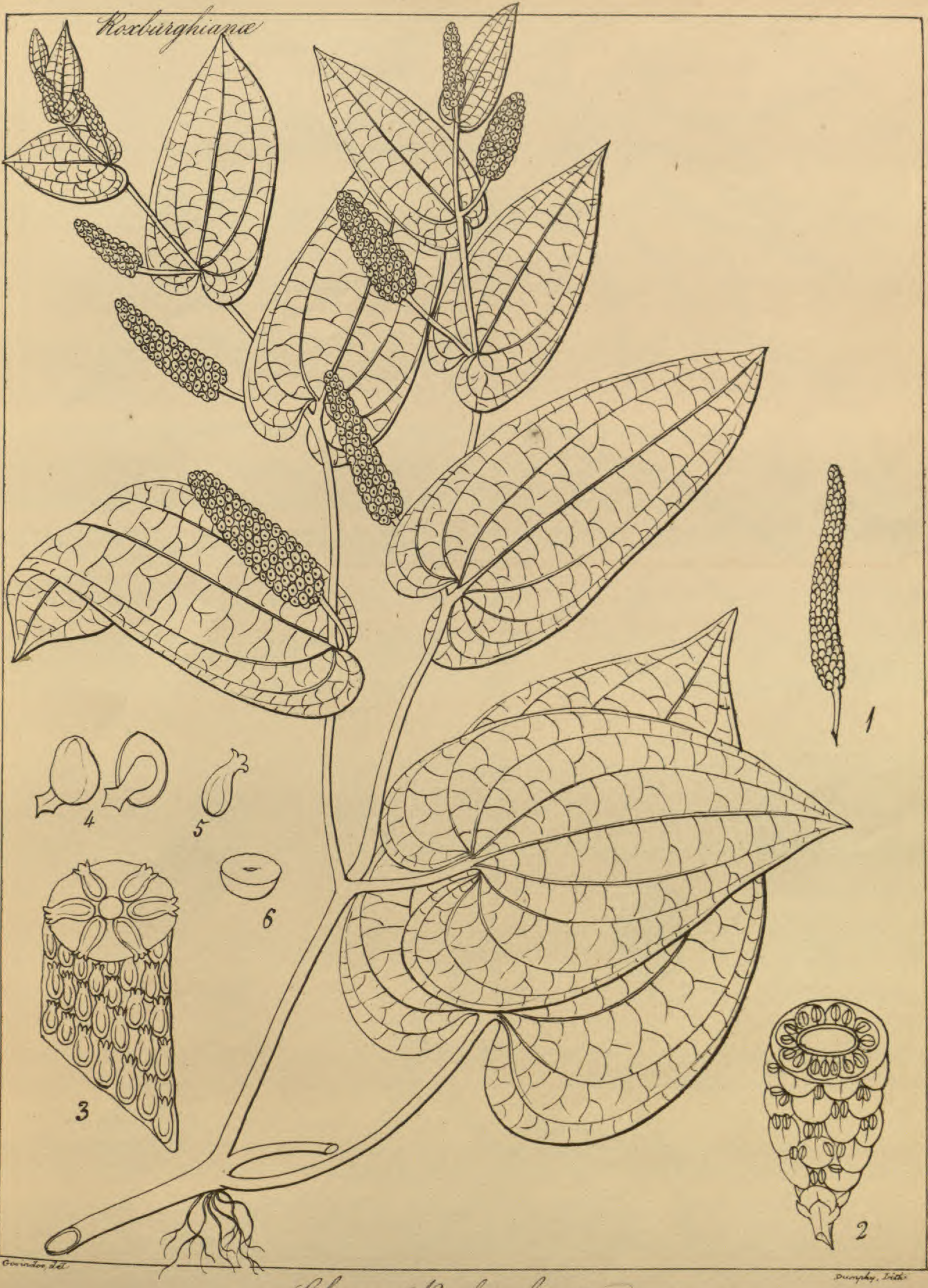
Pothomorphe subpeltana (Meq)

Chavica Betle (Miq)

Dunphy, Lith.



Chavica peepuloides (Miq)



Govindoo, del. Dumphy, Lith.

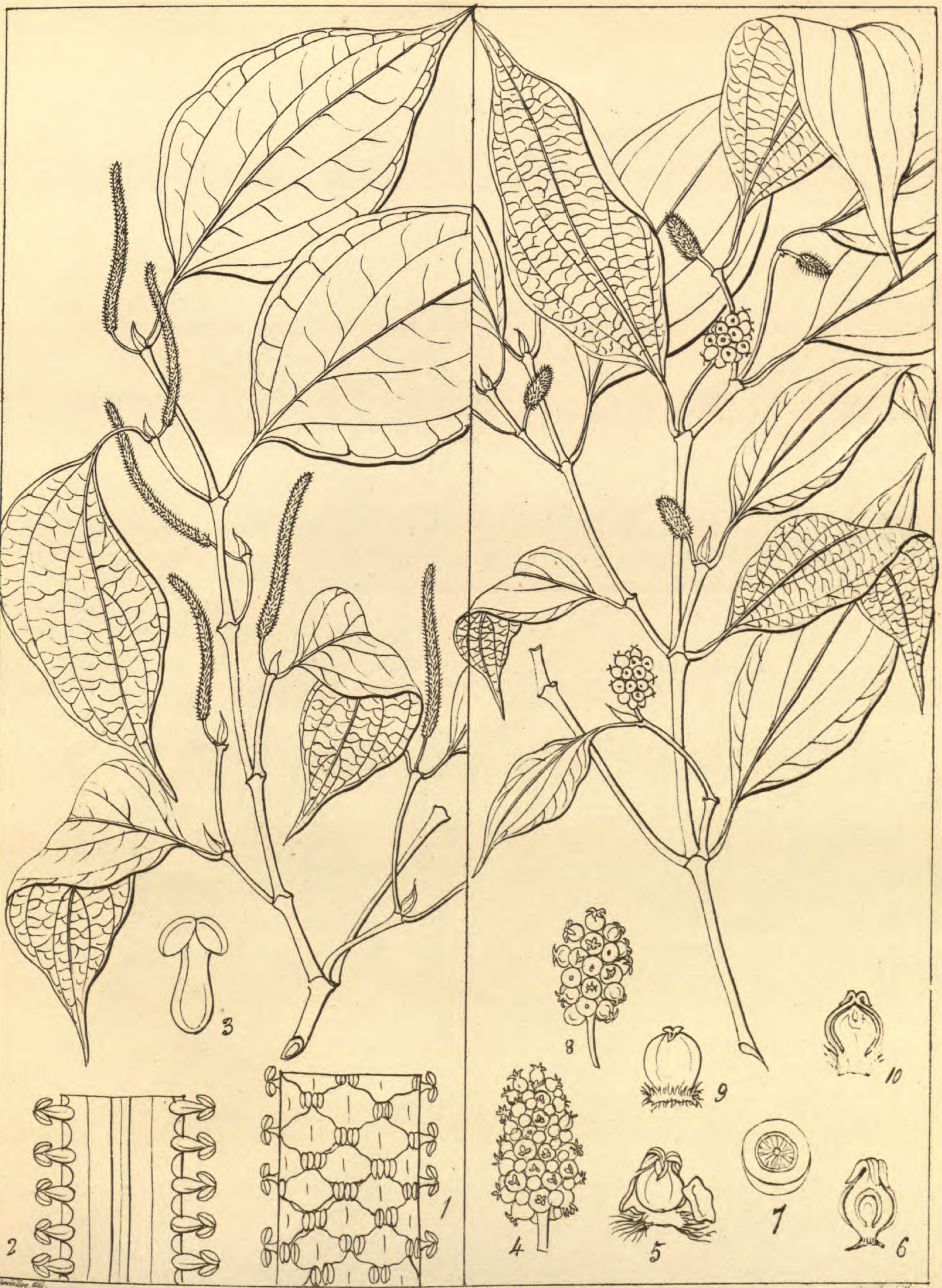
Chavica Roxburghii (Miq.)

Govindoo del. Dumphy Lith.

Chavica sarmentosa (Miq)

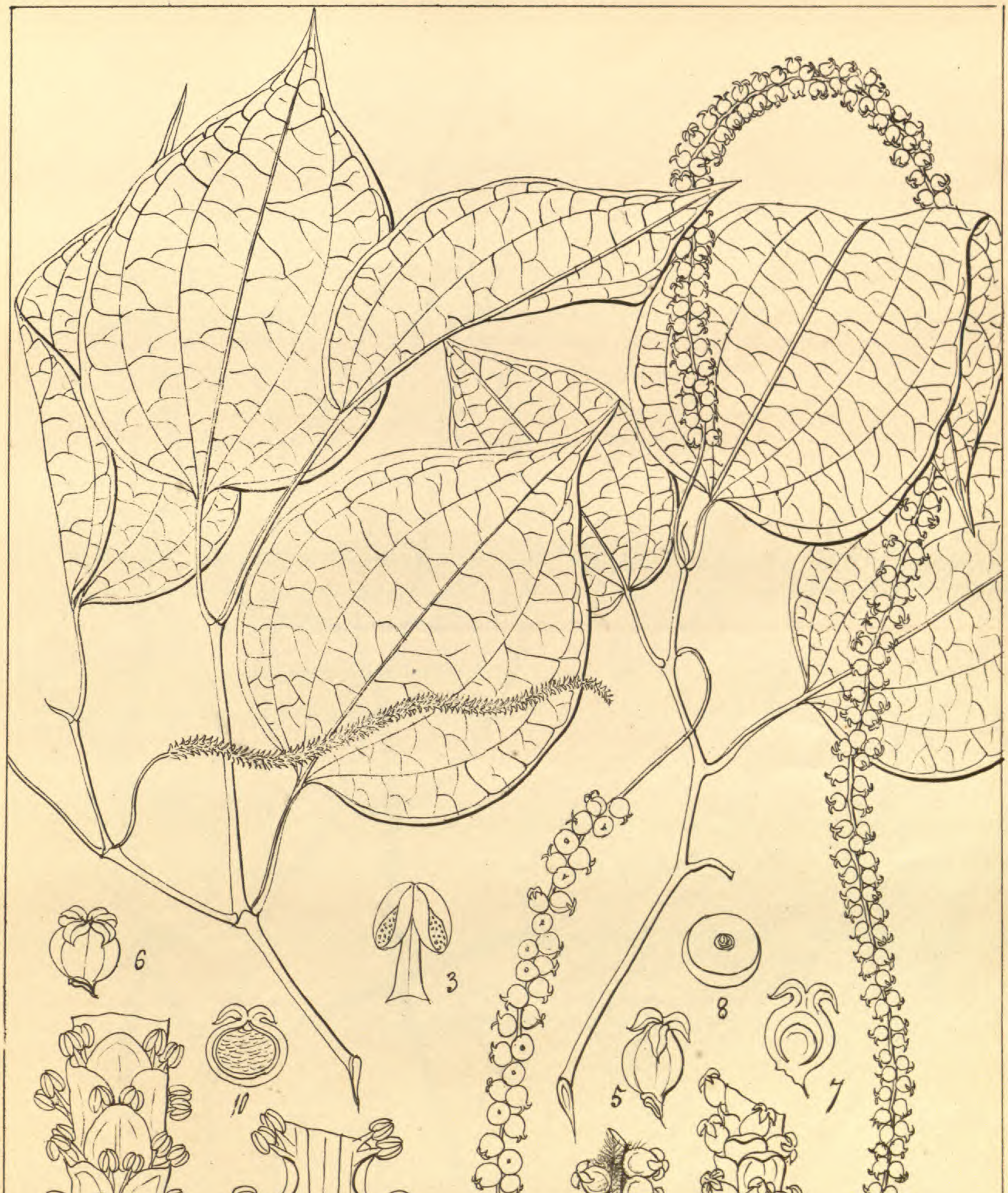
Govindoo, del. Dumphy, lith.

Chavica sylvatica (Miq.)



Chavica sphærostachya (Miq.)

Cubeba Wallichii (Miq)



Govindoo, del. Dempsey, Lith.

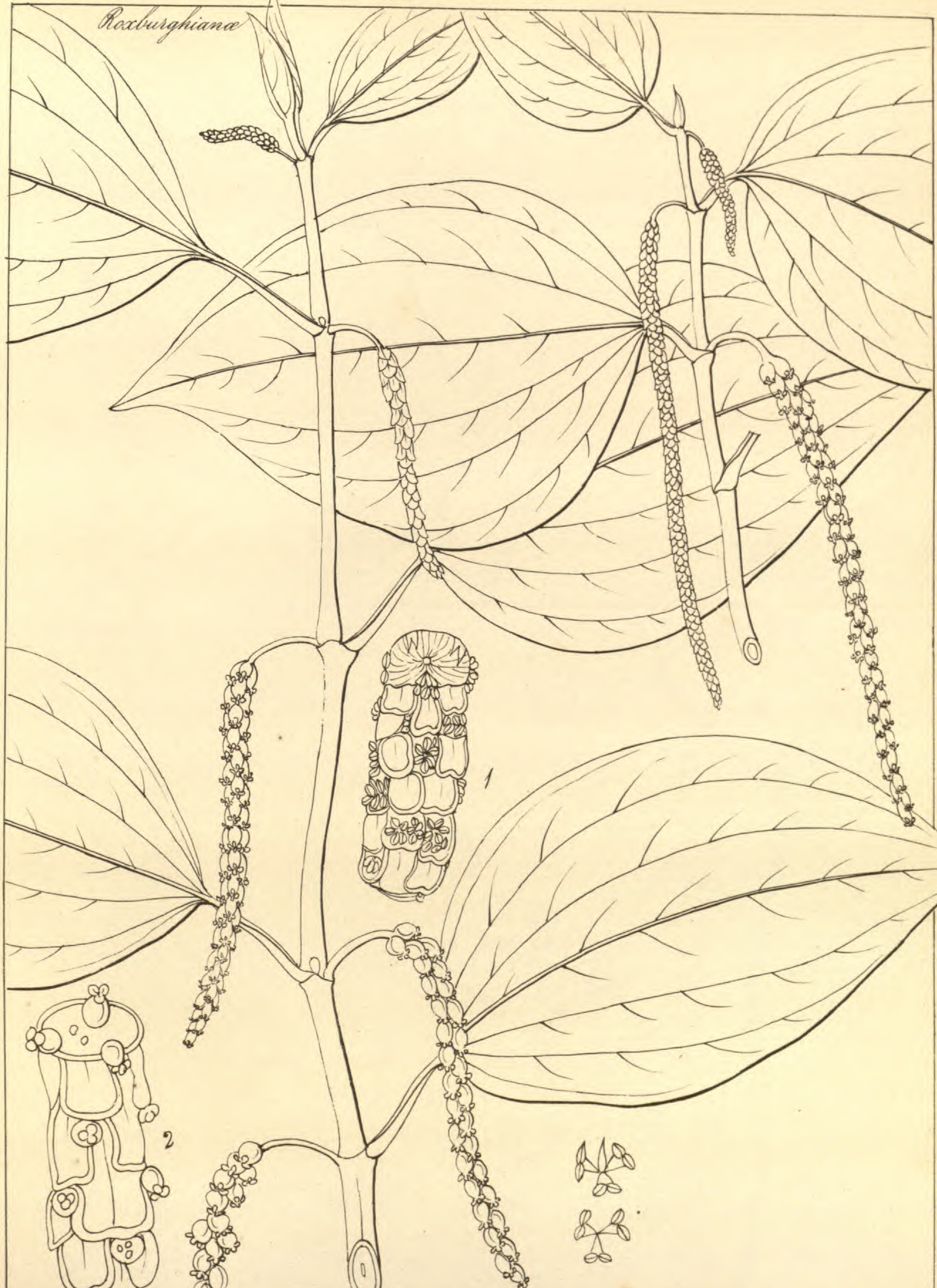
Piper attenuatum (Hamilt)

Gavindoo, del. Dumphy, Lith.

Piper nigrum (Linn.)

Govindoo, del. Dunphy, Lith.

Piper trioicum (Roxb)

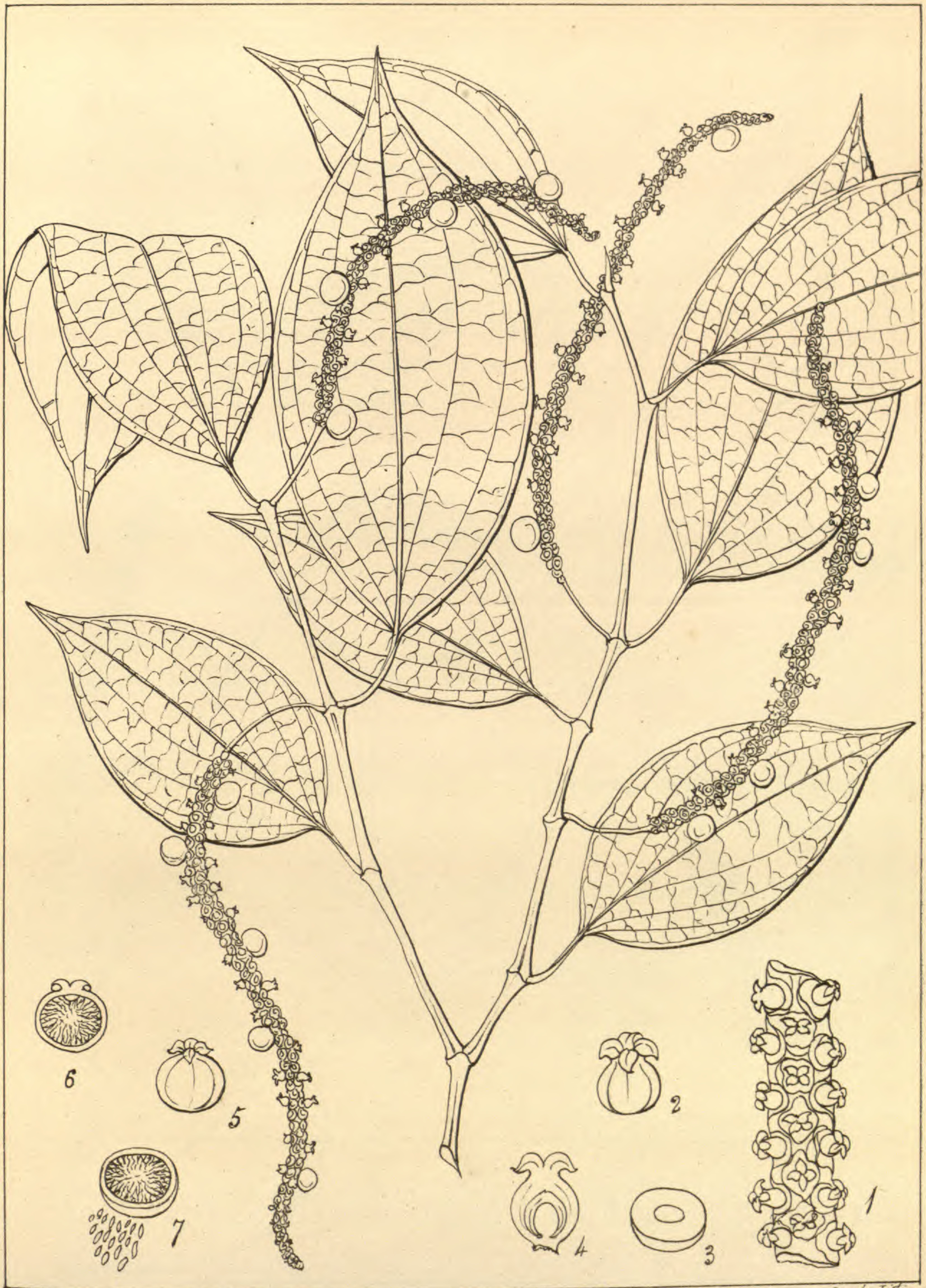


Govindoo, del. Dumphy, Lith.

Piper trioicum ♂ & ♀ (*Roxb.*)

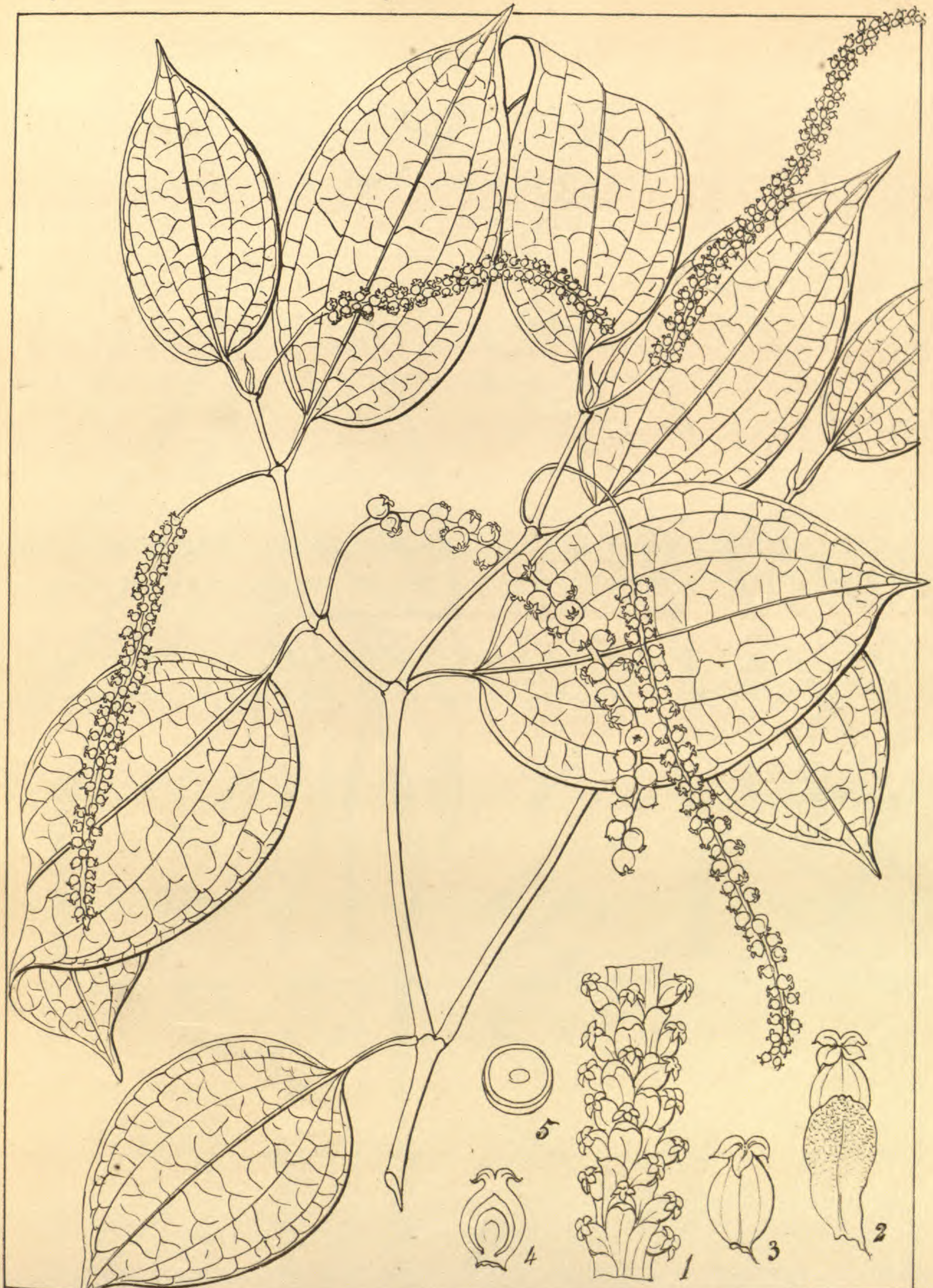
Govindoo, del.   Dumphy, lith.

Piper sylvestre (Lamarck)



Gowindoo, del. Dumphy, Lith.

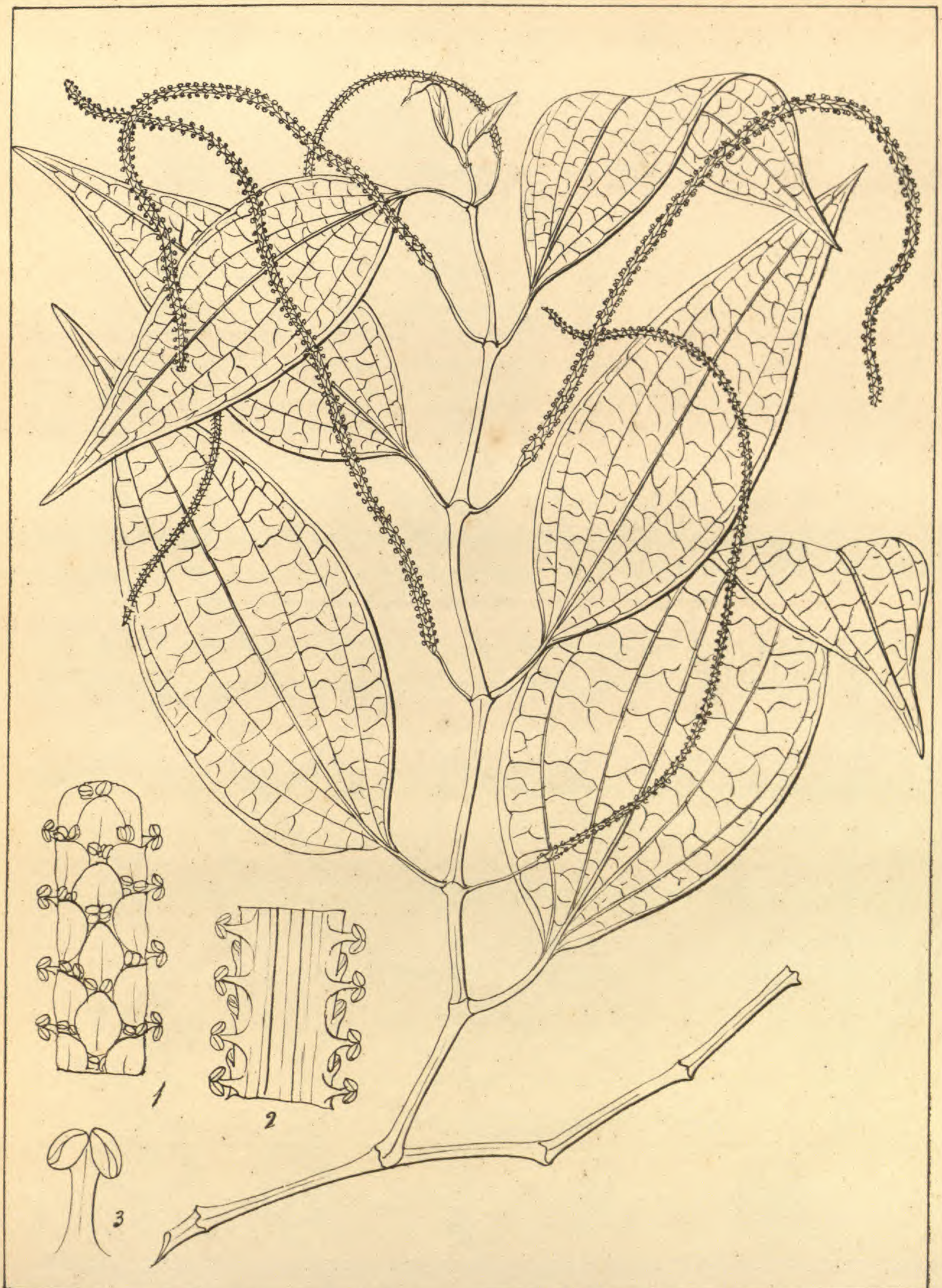
Piper nepalense (Miq)



Piper Wightiana (Miq.)

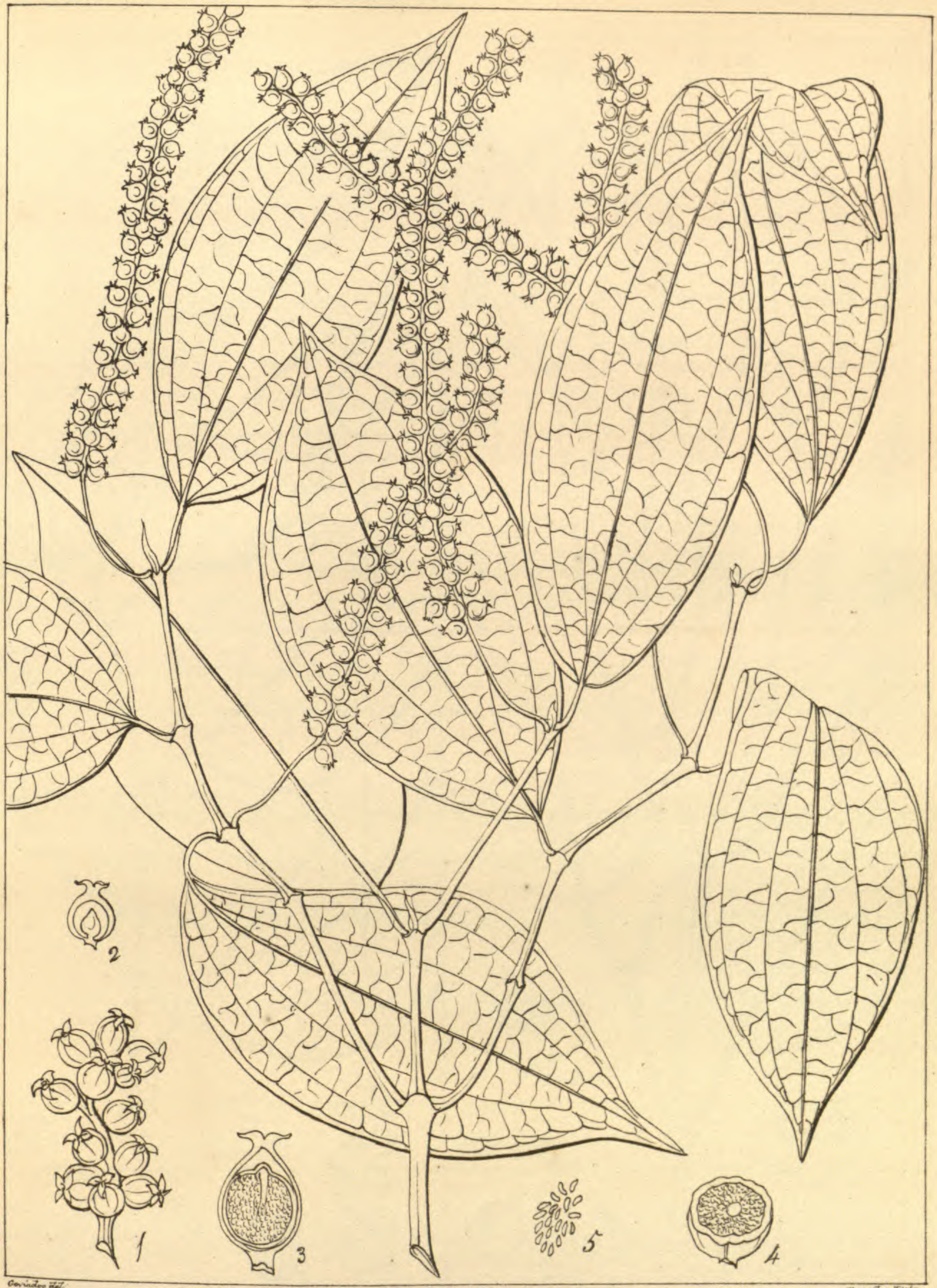
Govindoo, del. Dumphy, Lith.

Piper arborescens (Roxb.)



Govindoo, del. Dumphy, lith.

Piper argyrophyllum (Miq)



Govindoo, del. Dunphy, Lith.

Piper hymenophyllum (Miq.)

Govindoo del   Dumphy, lith.

Muldera Wightiana (Miq)

Govindoo, del. Dumphy, Lith.

Muldera trichostachya (Miq.)

Govindoo, del.

Dumphy, Lith.

Chloranthus Indicus (R.W.)

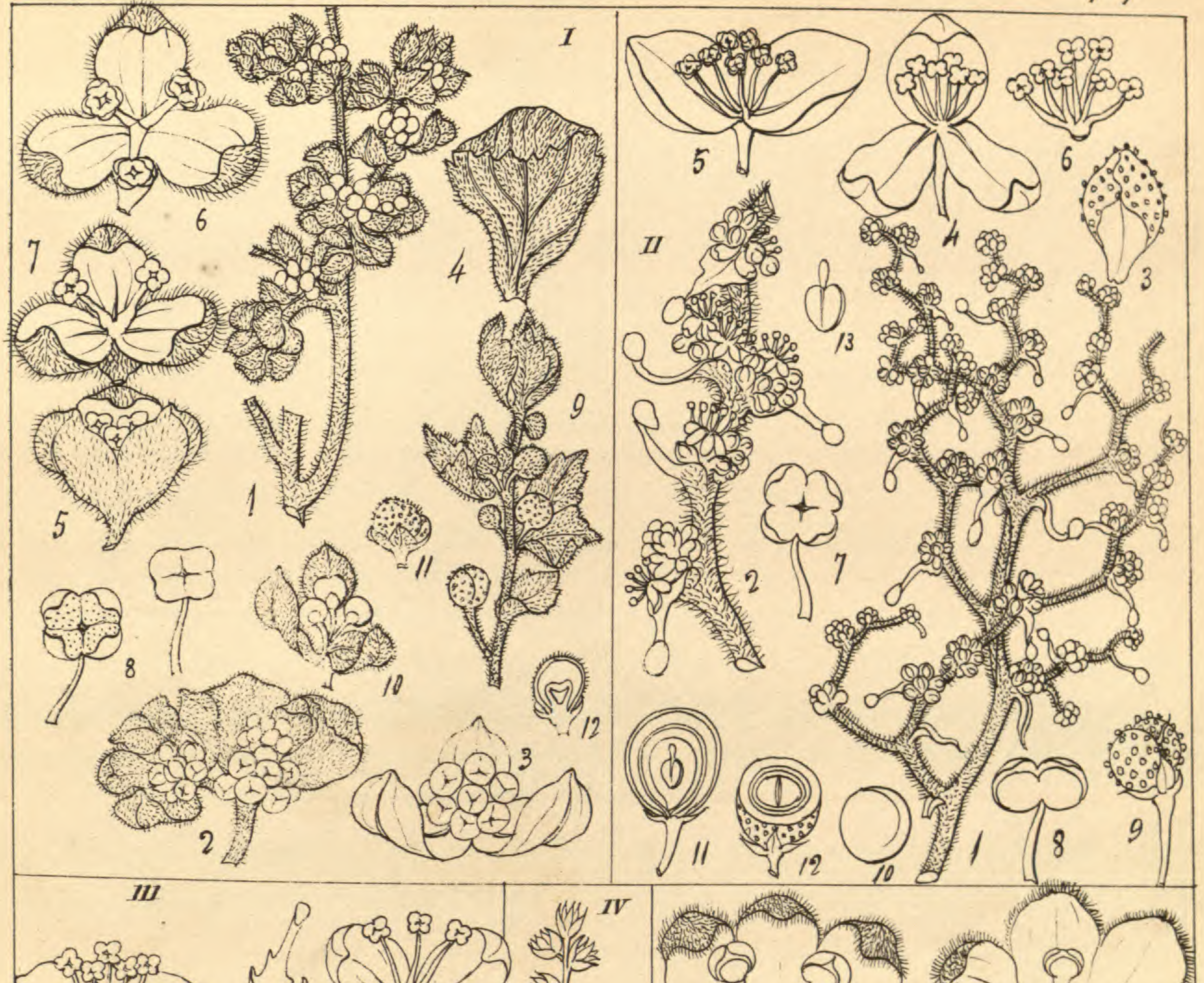
Govindoo, del. Dumphy, Lith.

Sarcandra cloranthoides (Gardner)

Govindoo, del. Dumphy, Lith.

Callitriche Wightiana.

I. II. Ceratophyllum muricatum (Cham.) III. C. tuberculatum (Cham.)
IV. C. missionis (Wall.)



Govindoo, del. Dunphy, lith.

I. *Macaranga tomentosa.* II. *Indica.* III. *M. flexuosa*
IV. *M. Roxburghii.* V. *Pachystemon trilobium (Bl.)*

Govindoo, del. Dumphy, lith.

Sapium populifolium *Sapium Indicum*

Govindoo, del. Dunphy, Lith.

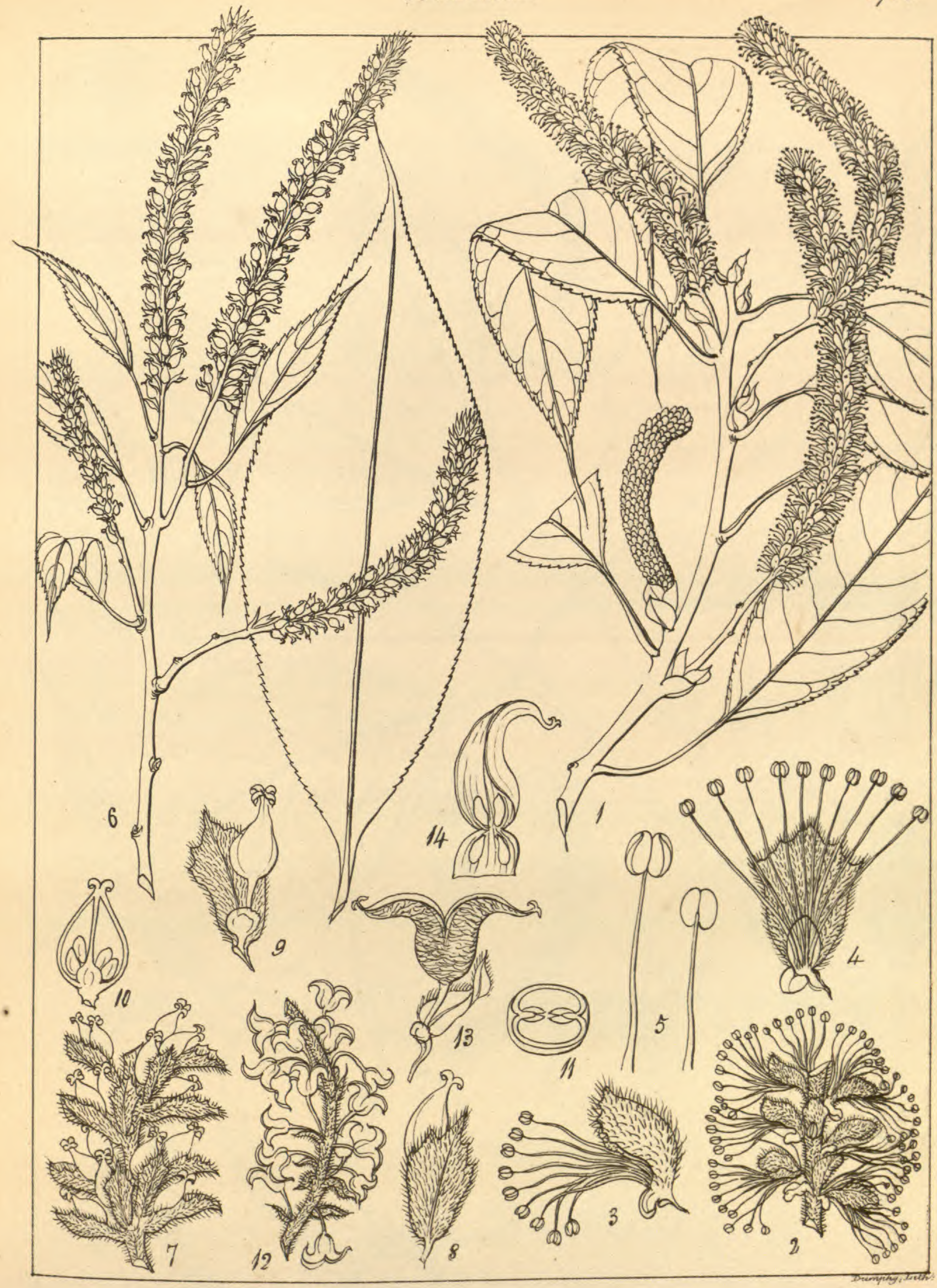
Sauropus retroversa (R.W.) S. Gardneriana (R.W.)

Gevinder, del. Dumphy, Lith.

Sauropus zeylanica (R.W.) S. Indica (R.W.)

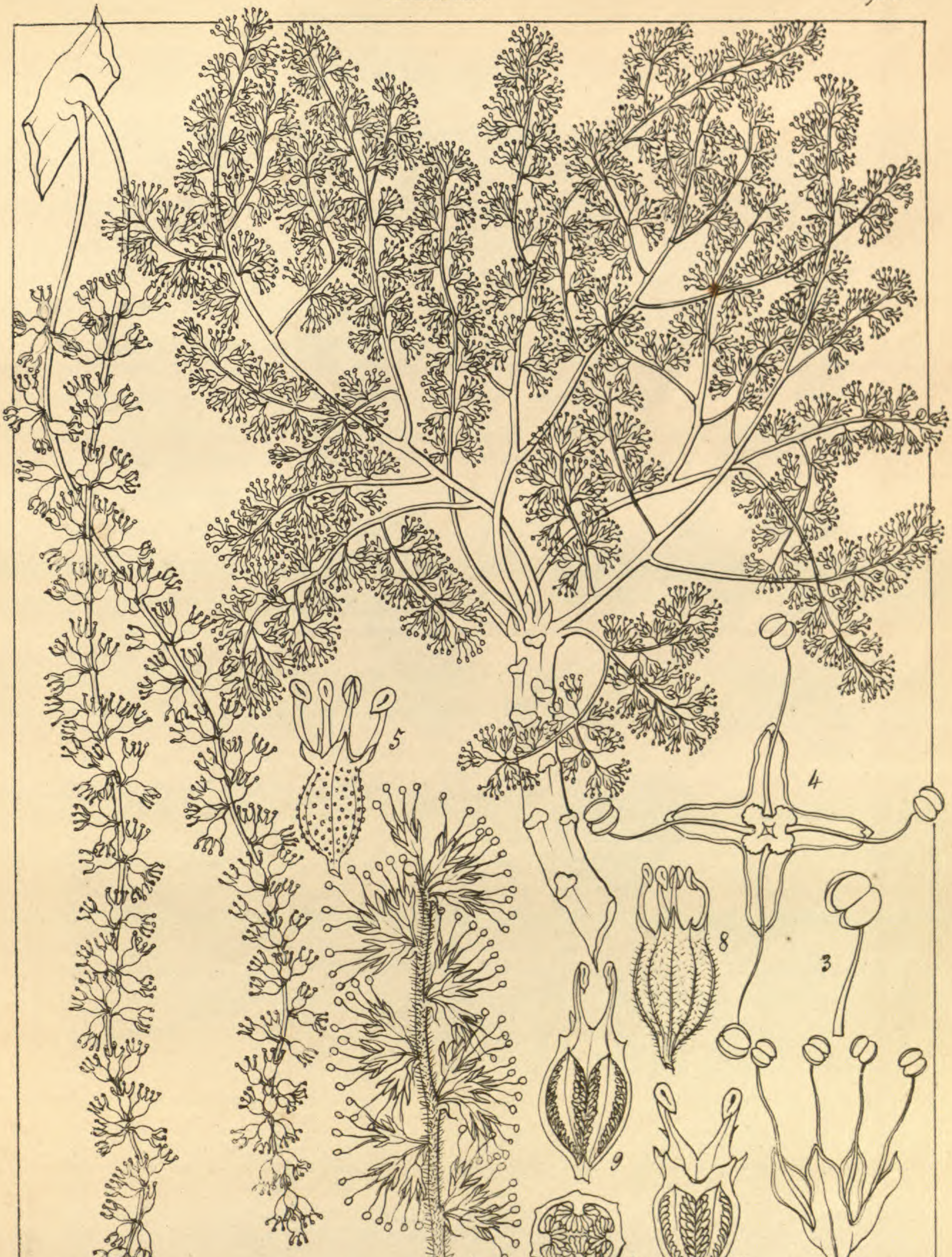
Govindoo, del. Dumphy, lith.

Salix ichnostachya (Lind)



Salix tetrasperma (Roxb.)

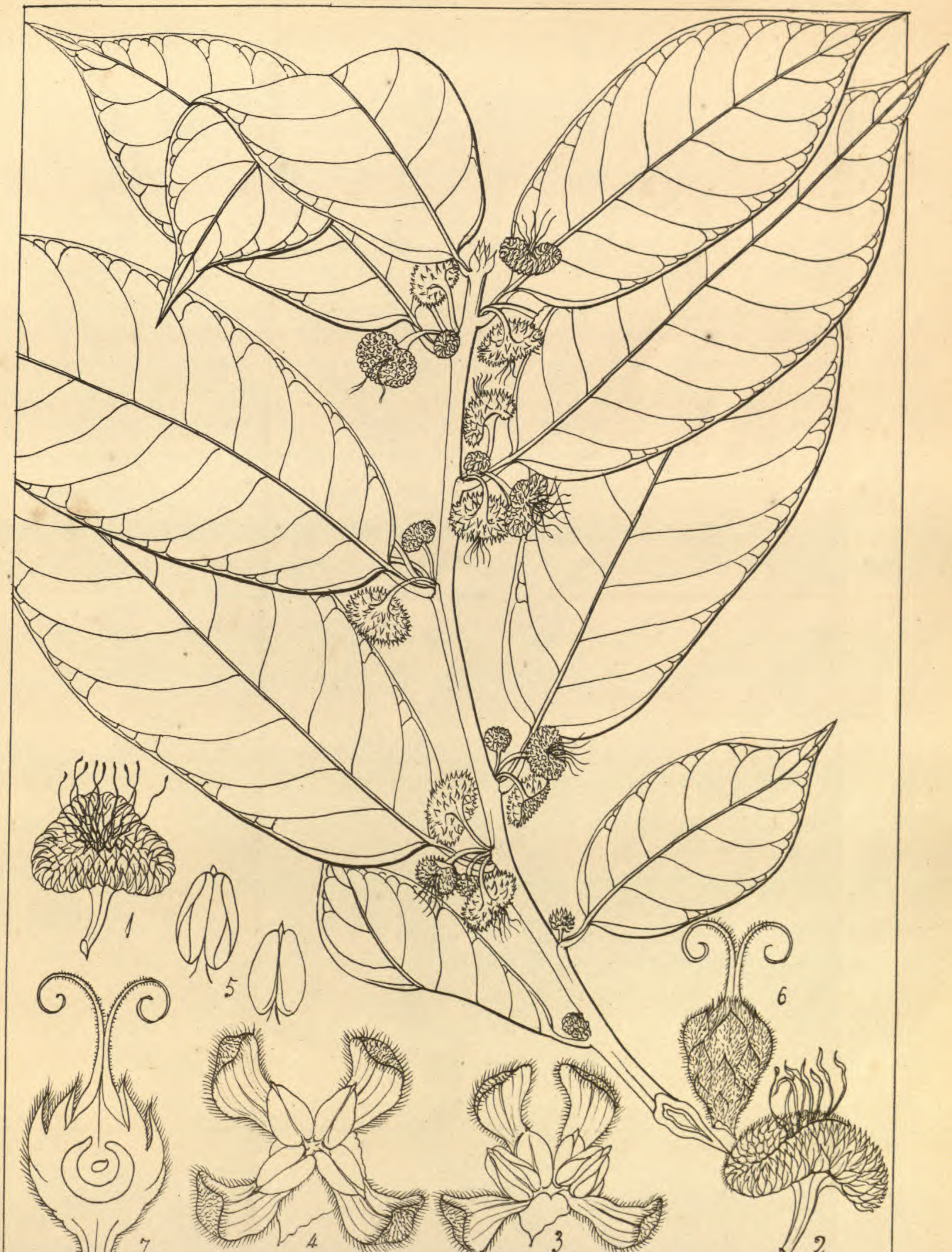
Gnetum funiculare (Buch: Smith.)



Tetrameles Grahamiana (R.W.)
Anictoclea Nimmo

Govindoo, del. Dumphy, Lith.

Artocarpus hirsuta (Lam Roxb.)



Govindoo, del. Dumphy, lith.

Antiaris saccidora (Dalgell)

Govindoo, del. Dumphy, Lith.

Conocephalus niveus (R.W.)

Govindoo, del. Dumphy, Lith.

Cudrania javanensis (Trecul)

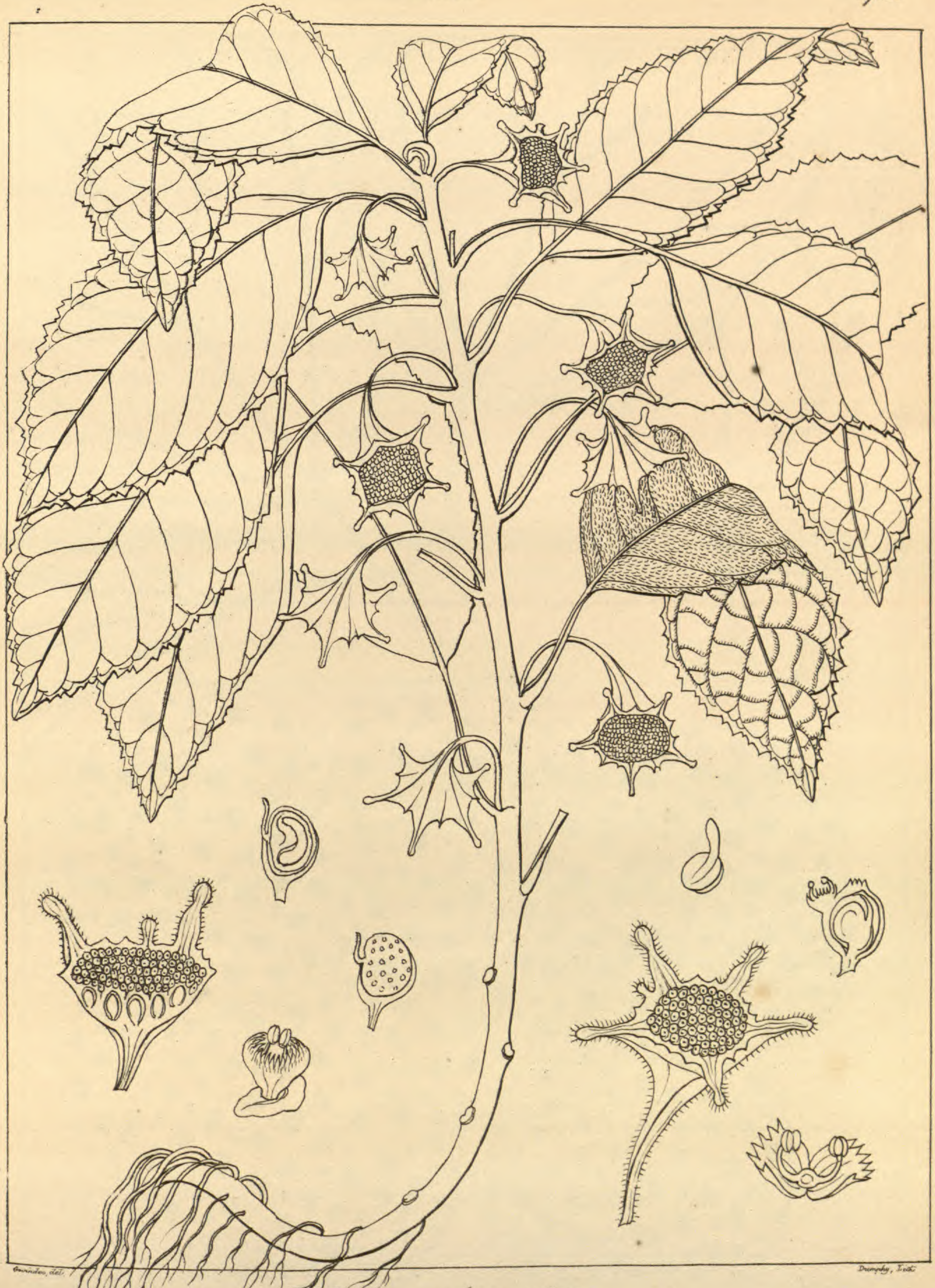
Govindoo, del. Dunphy, Lith.

Epicarpurus orientalis

Epicarpurus spinosus (R.W.)

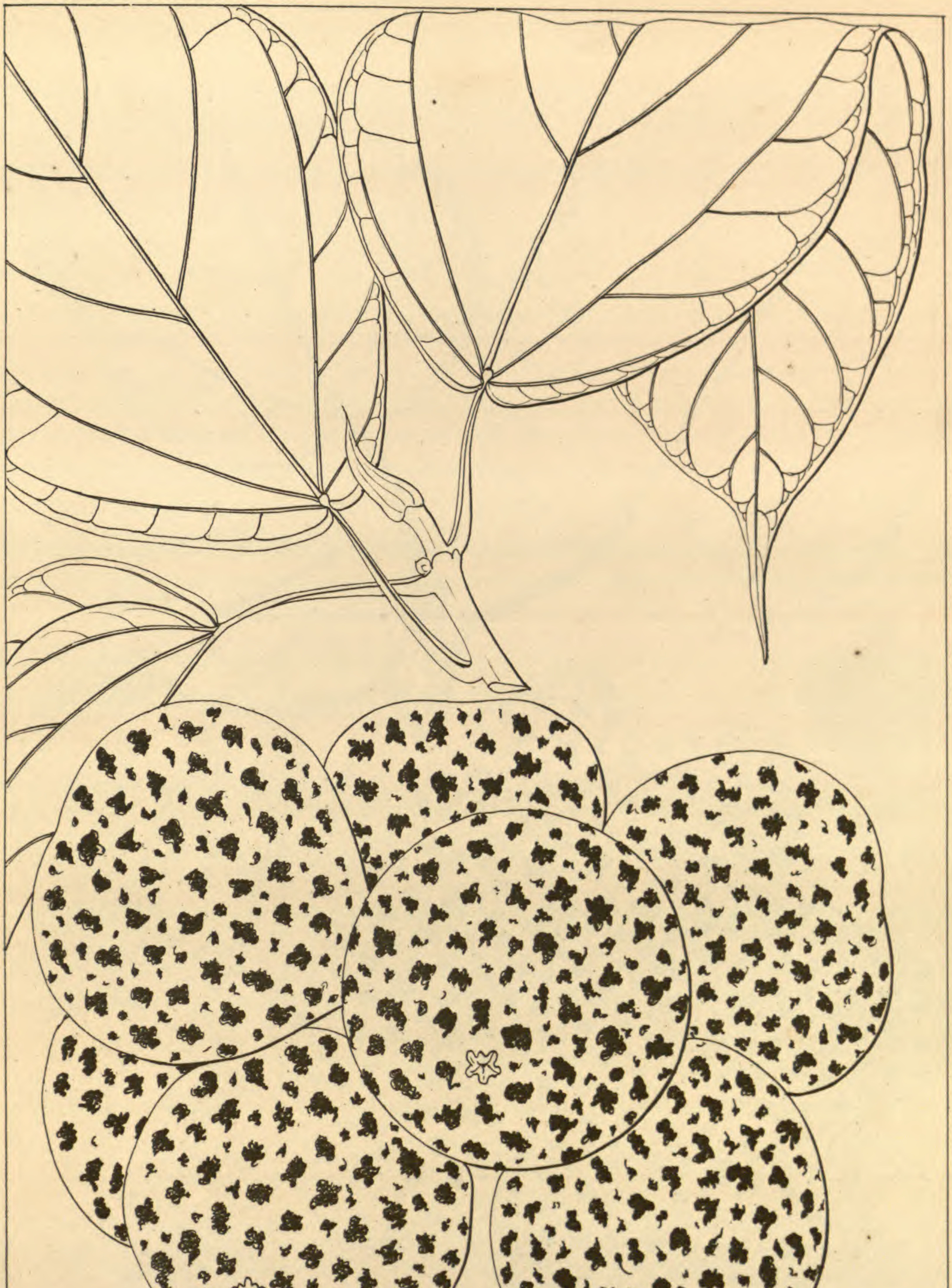
Gerindo, del. Dunphy, Lith.

Plecospermum spinosum (Trecul.)



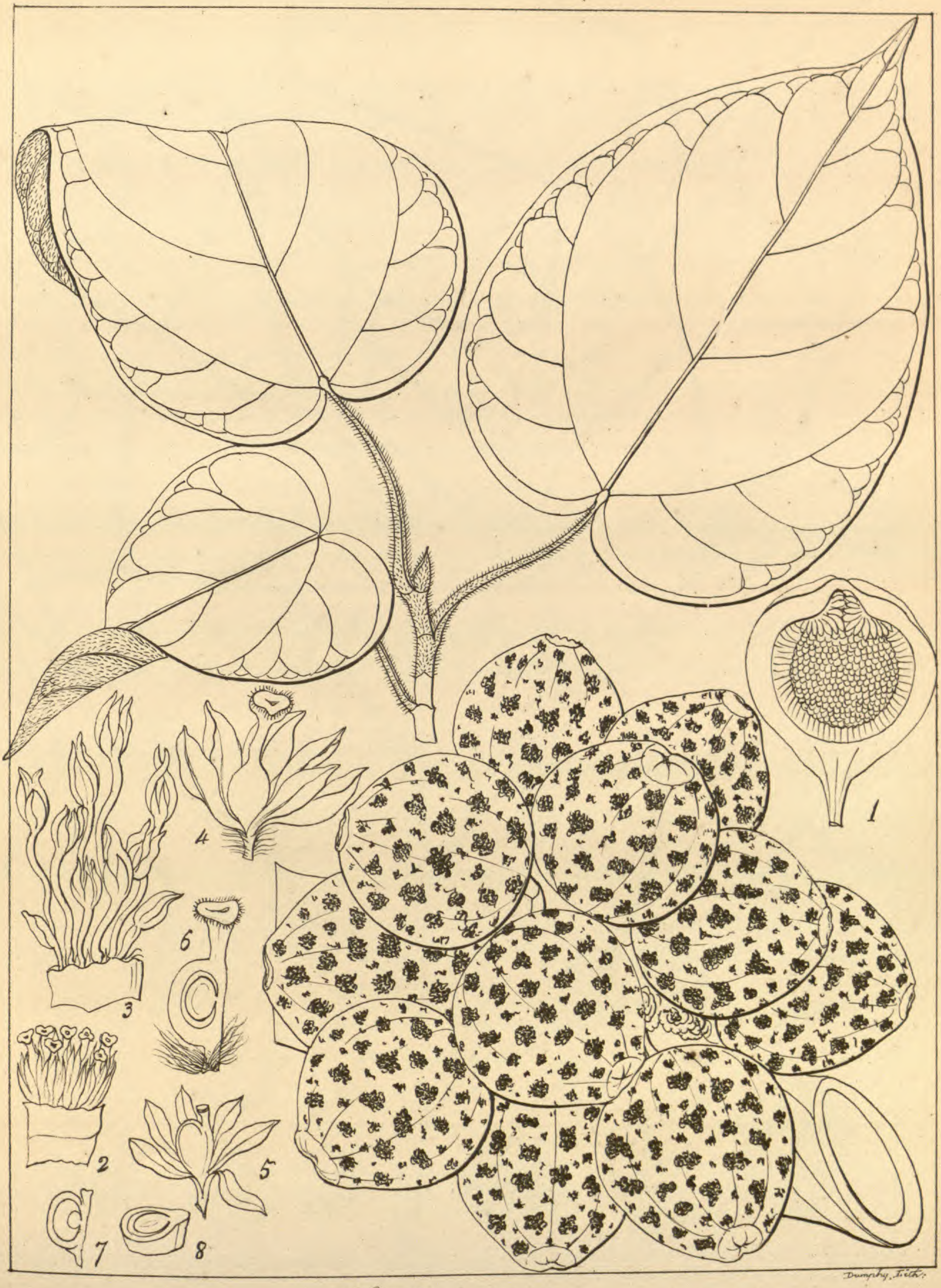
Govindoo, del. Dumphy, Lith.

Dorstenia Indica (R.W.)



Govindoo, del. Dumphy, Lith.

Pogonotrophe macrocarpa



Covellia guttata (R.W.)

Urostigma religiosum (Miq.)

Govindoo, del. Dumphy, Lith.

Holopetala intigrifolia (Planch)

Celtis(s) Wightii (Planch)

Govindoo, del. Dunphy, Lith.

Celtis (euceltis) serotina (Planch)

Govindoo del. Dumphy, Lith.

Sponia Wightii (Planch)

Govindoo, del. Dumphy, Lith.

Laportea termenalis (R.W.)

Govindoo, del.

Dumphy, lith.

Pilea trinervia (R.W.)

Dumphy, Lith.

Pilea radicans (R.W.)

Dumphy, Lith.

Fleurya interrupta (R.W.)

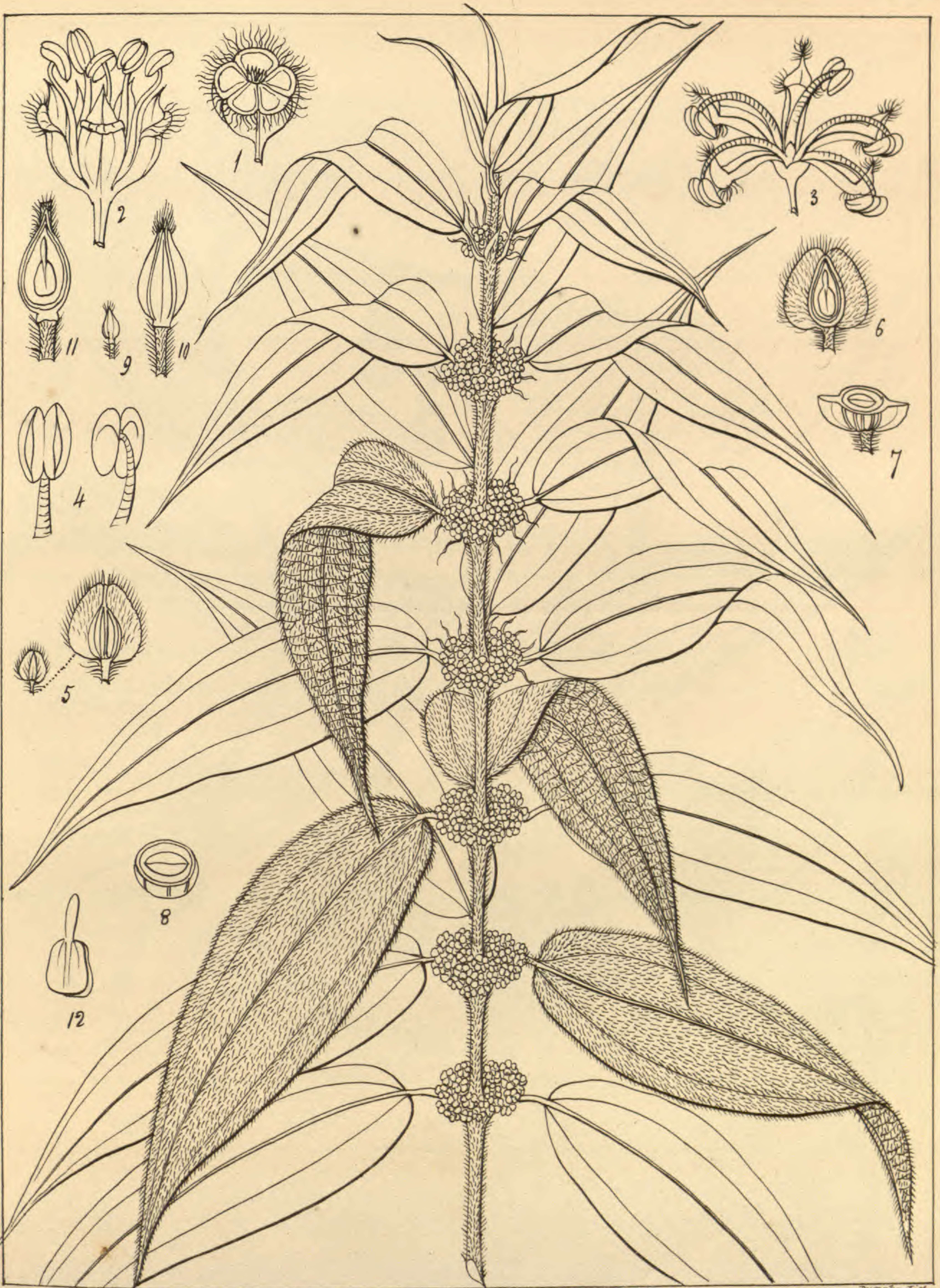
Dumphy, Lith

Gardinia Leschenaultiana δ (Depe)

Girardinia Leschenaultiana ♀ (Dcne)

Govindoo, del. Dumphy, Lith.

Aplitgerbera macrostachya (R.W.)



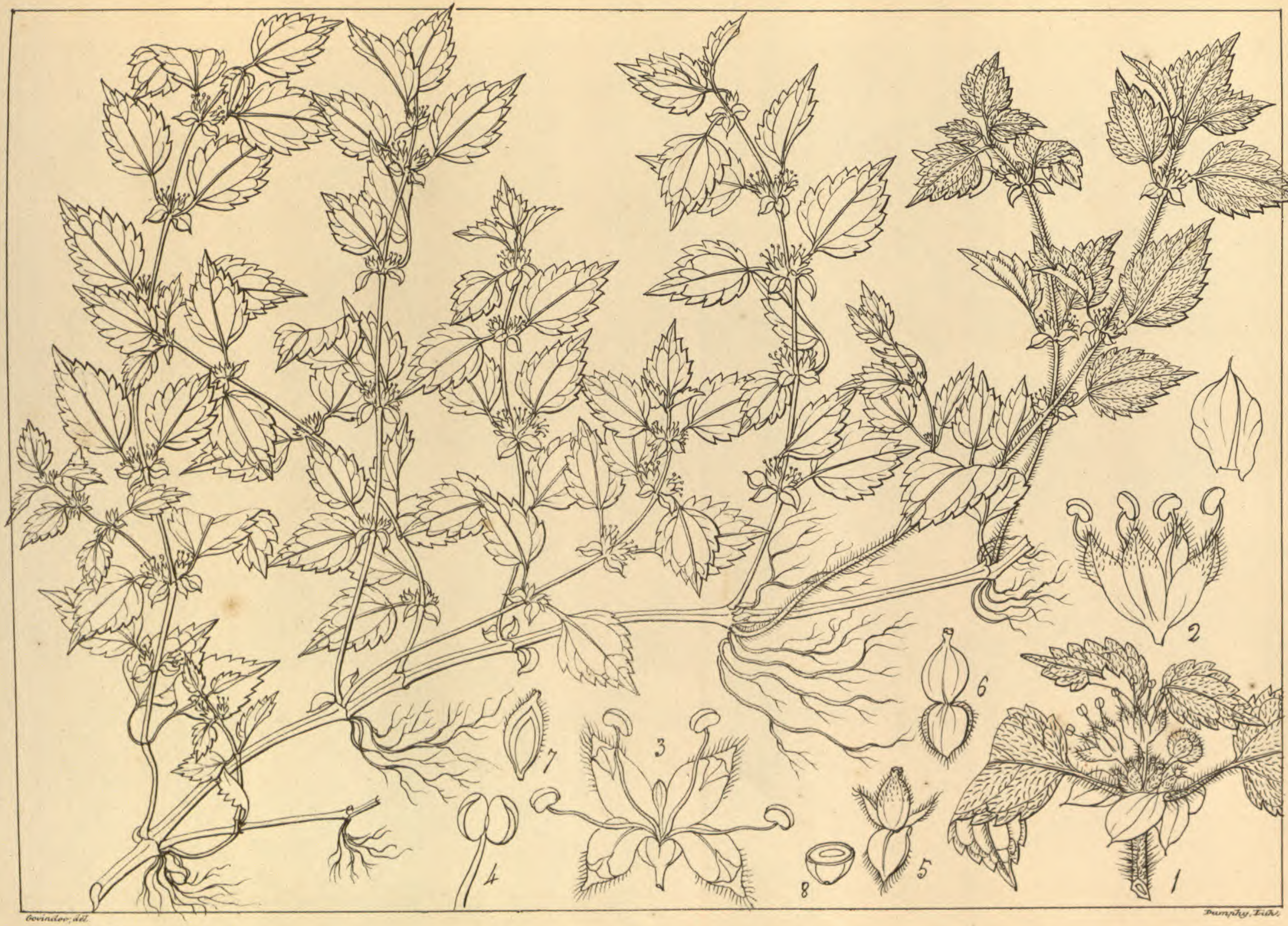
Govindoo, del. Dunphy, lith.

Pouzolzia Bennettiana (R.W.)

Dunphy, Lith.

Pouzolzia intigrifolia (Dalzell) P. cymosa.

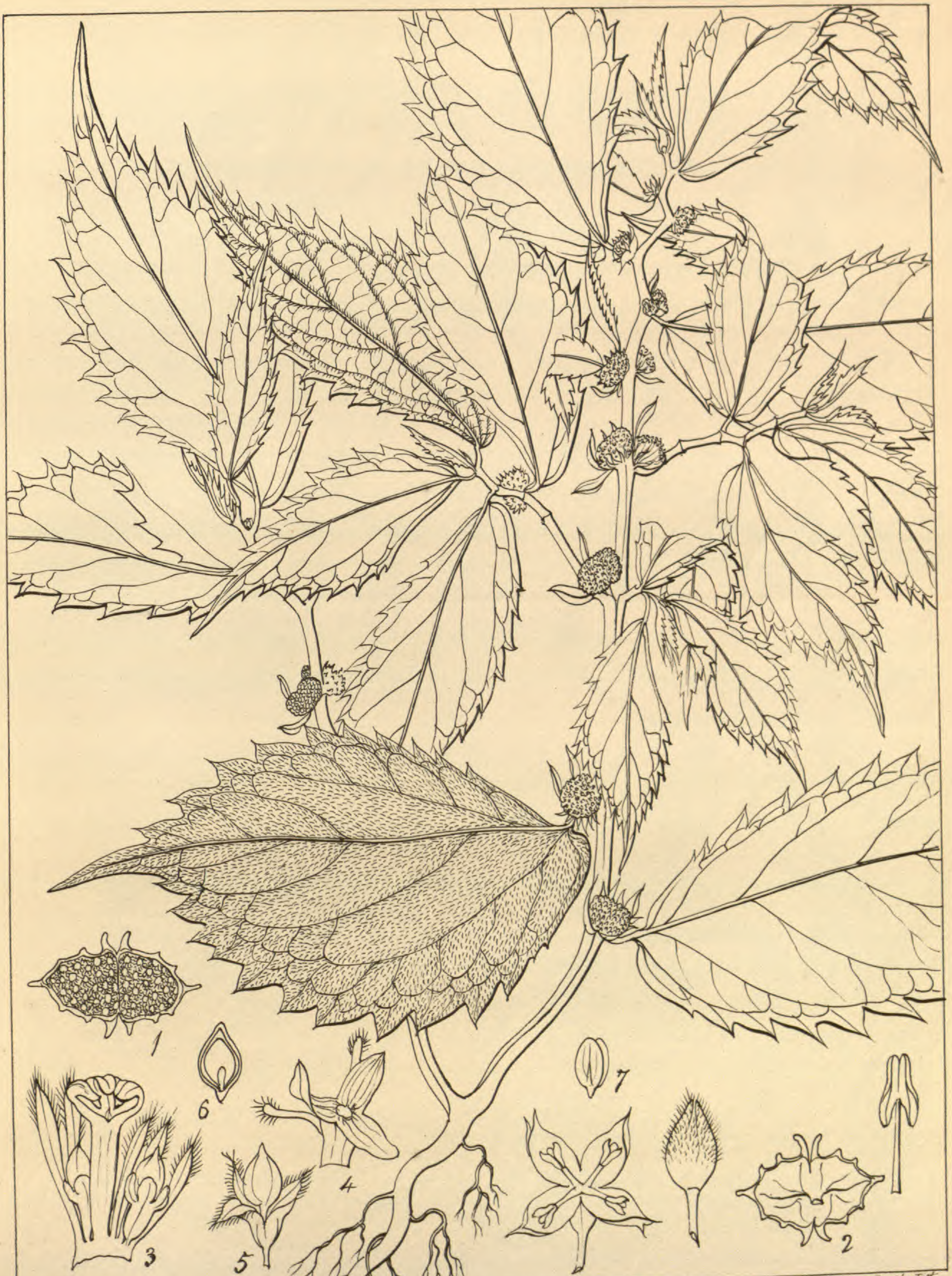
1. Pouzolzia Indica. II. P. auriculata (R.W.) III. P. rostrata (R.W.)



Govindoo, del. Dunphy, Lith.

Chamabainia cuspidata (R.W.)

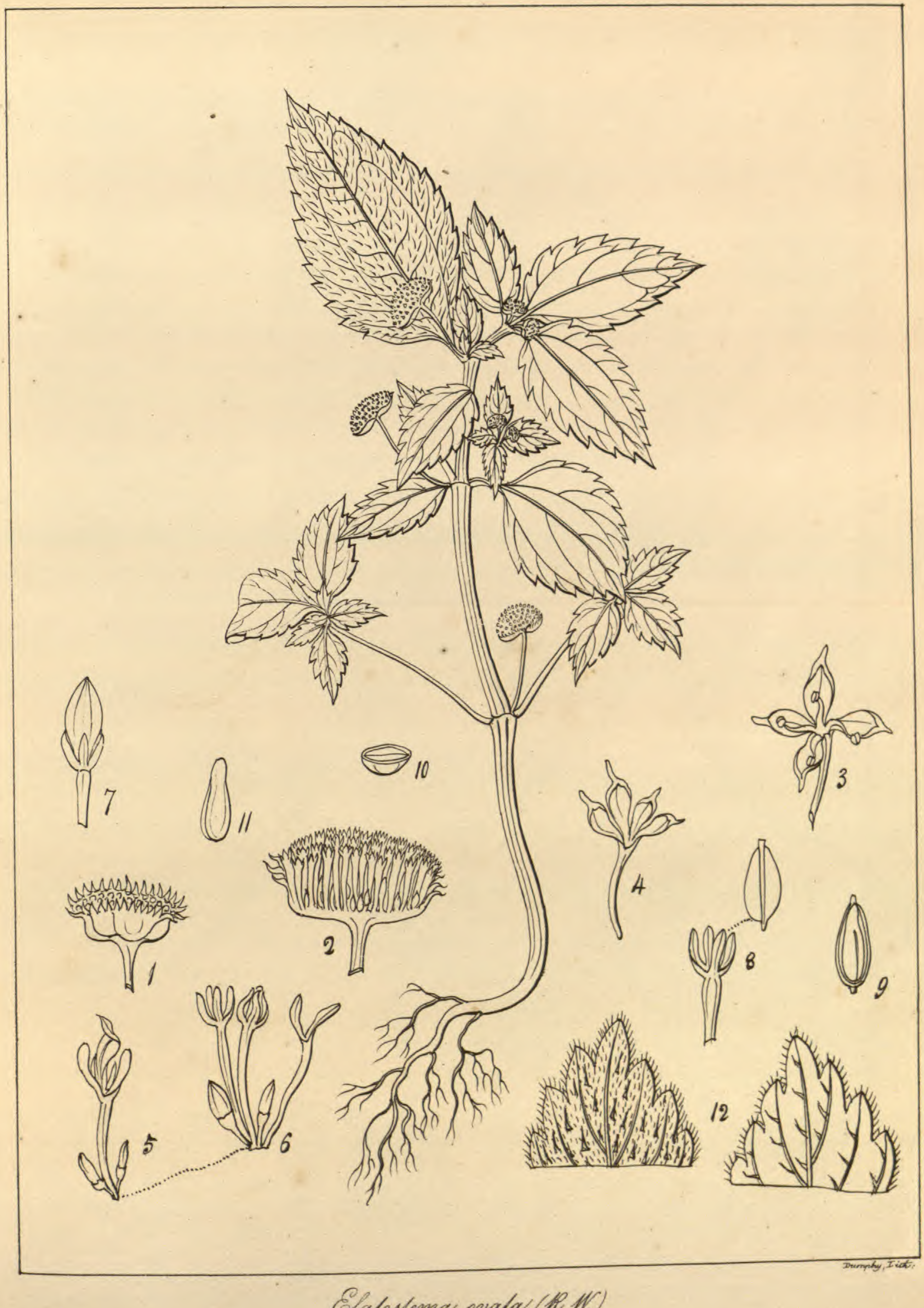
Forskolia urticoides (R.W.)



Govindoo, del. Dunphy, lith.

Elatostema cuspedata

Elatostema lineolata (R.W.)



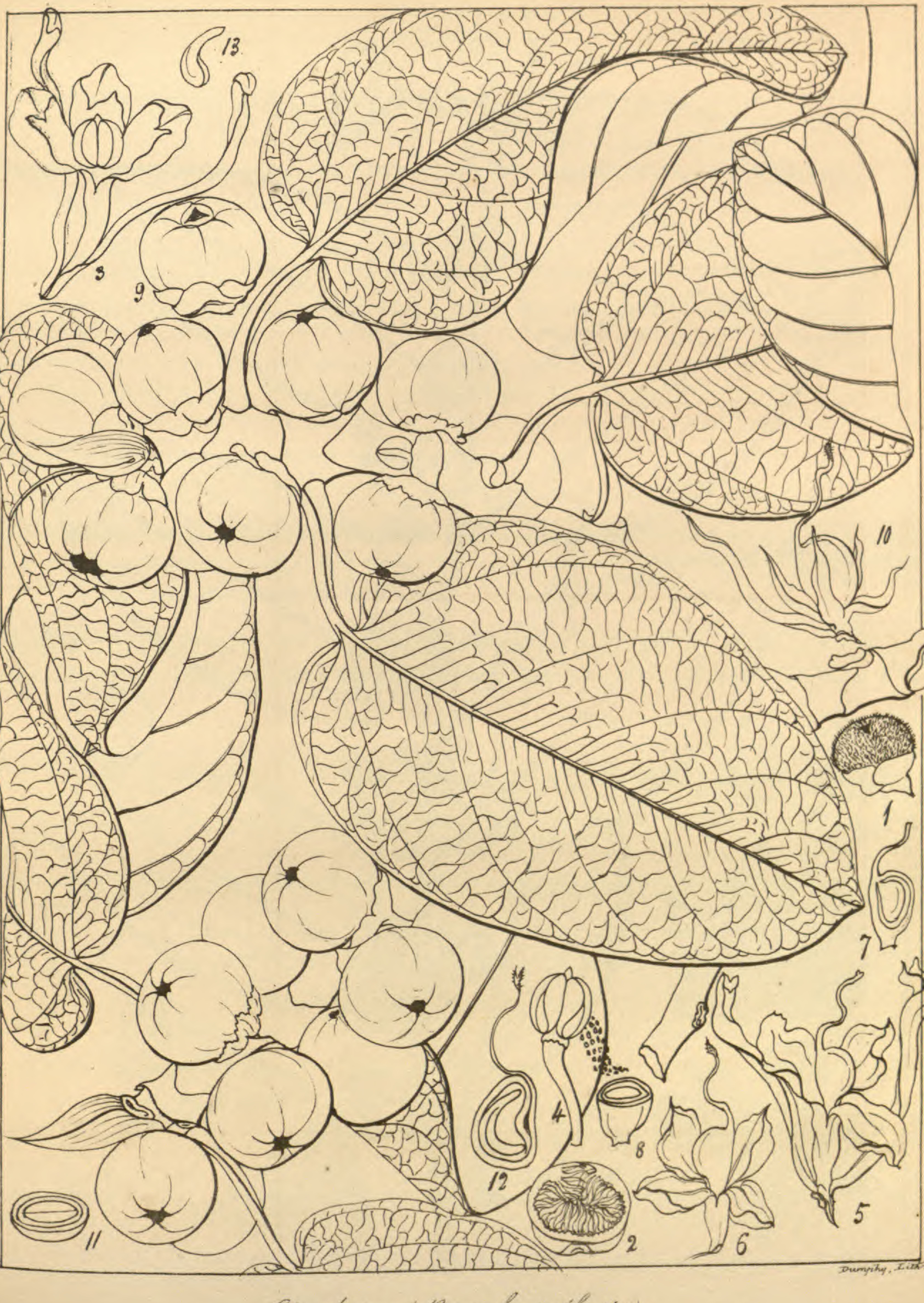
Elatostema ovata (R.W.)

Govindoo, del. Dumphy, Lith.

Aspidopteris glomerata (R.W.)

Govindoo del. Dumphy Lith.

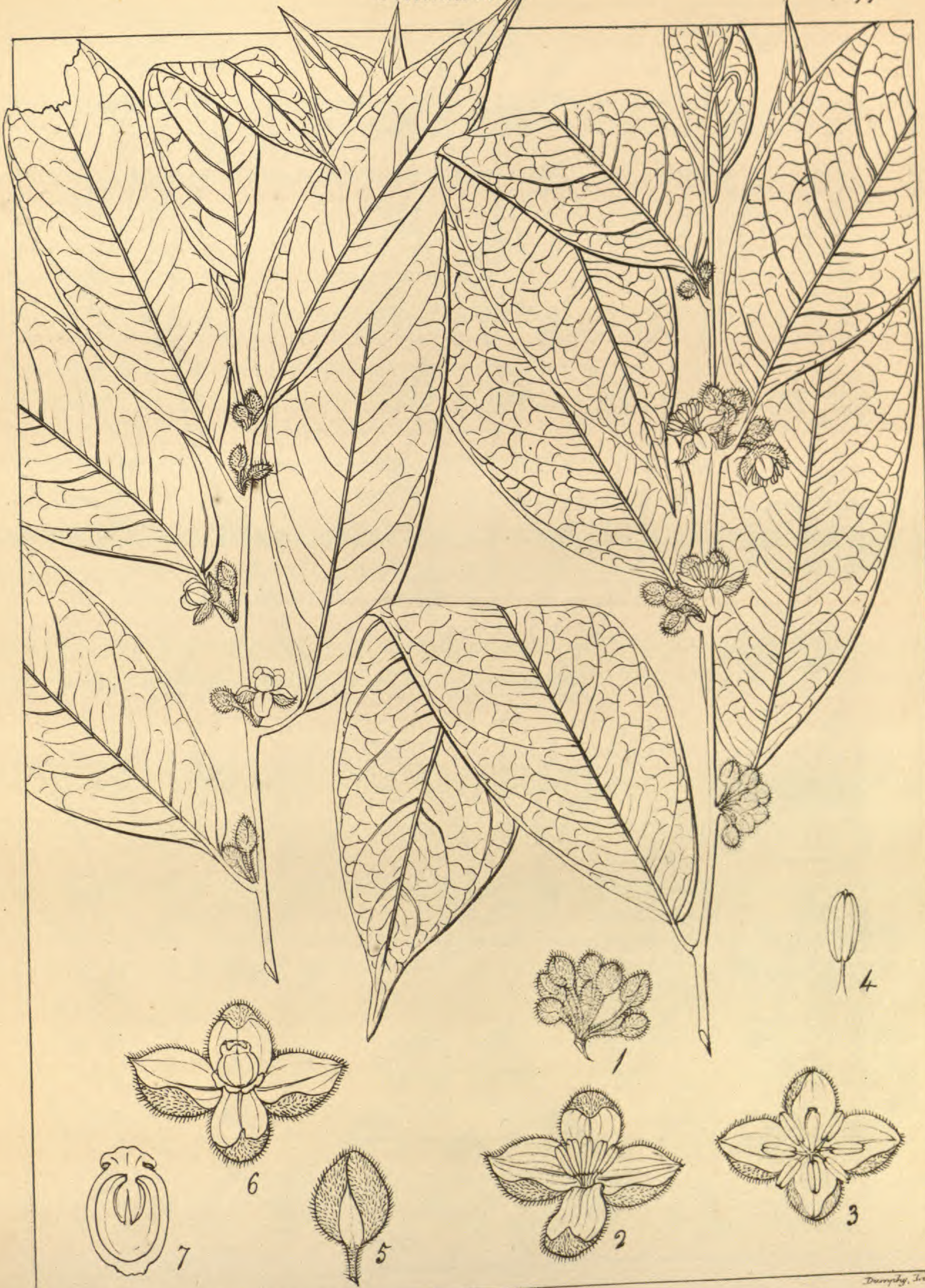
Ancistrocladus Heyneanus (Wall)



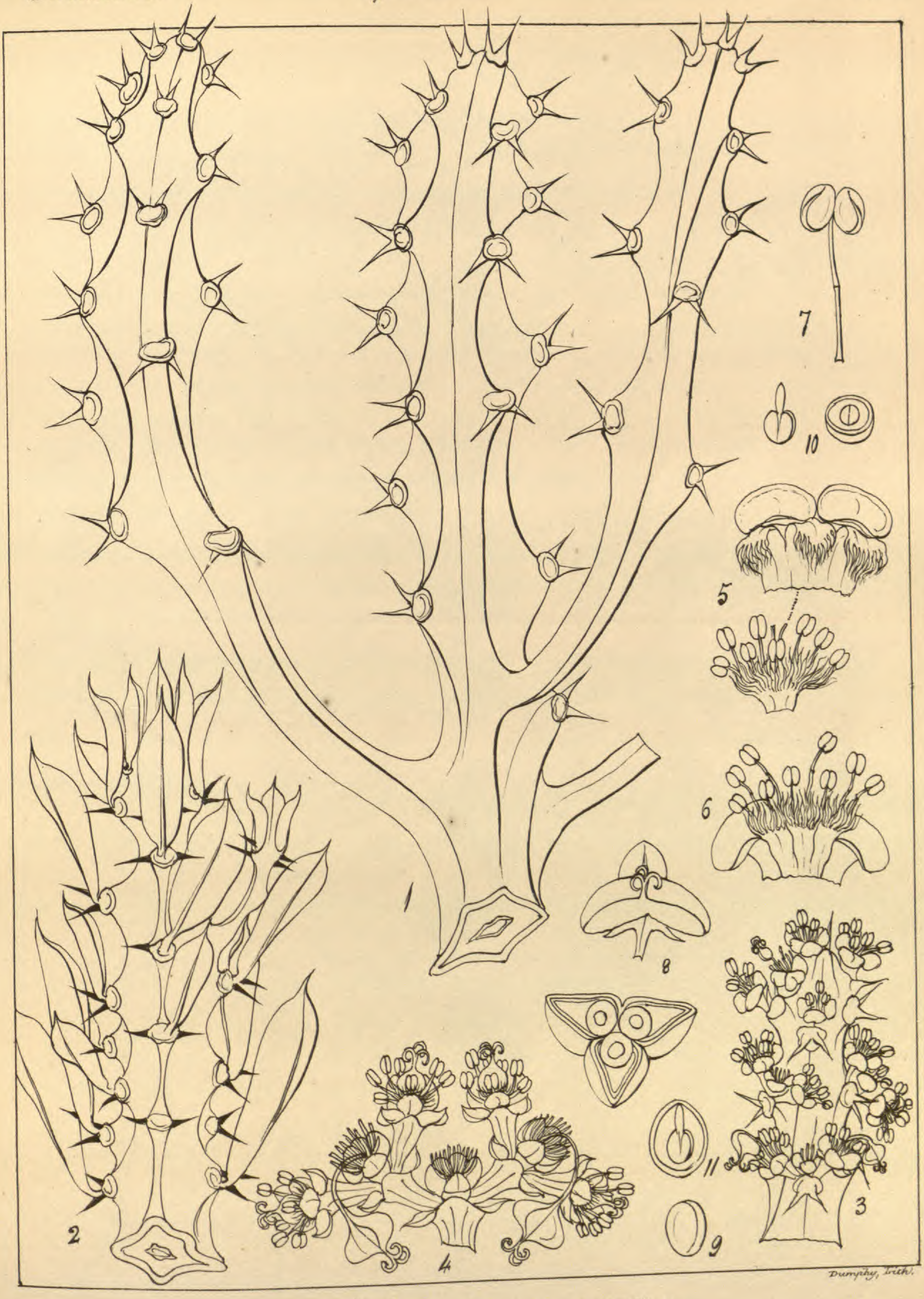
Urostigma Bengalense (Gasp.)

Sponia velutina (Planch)

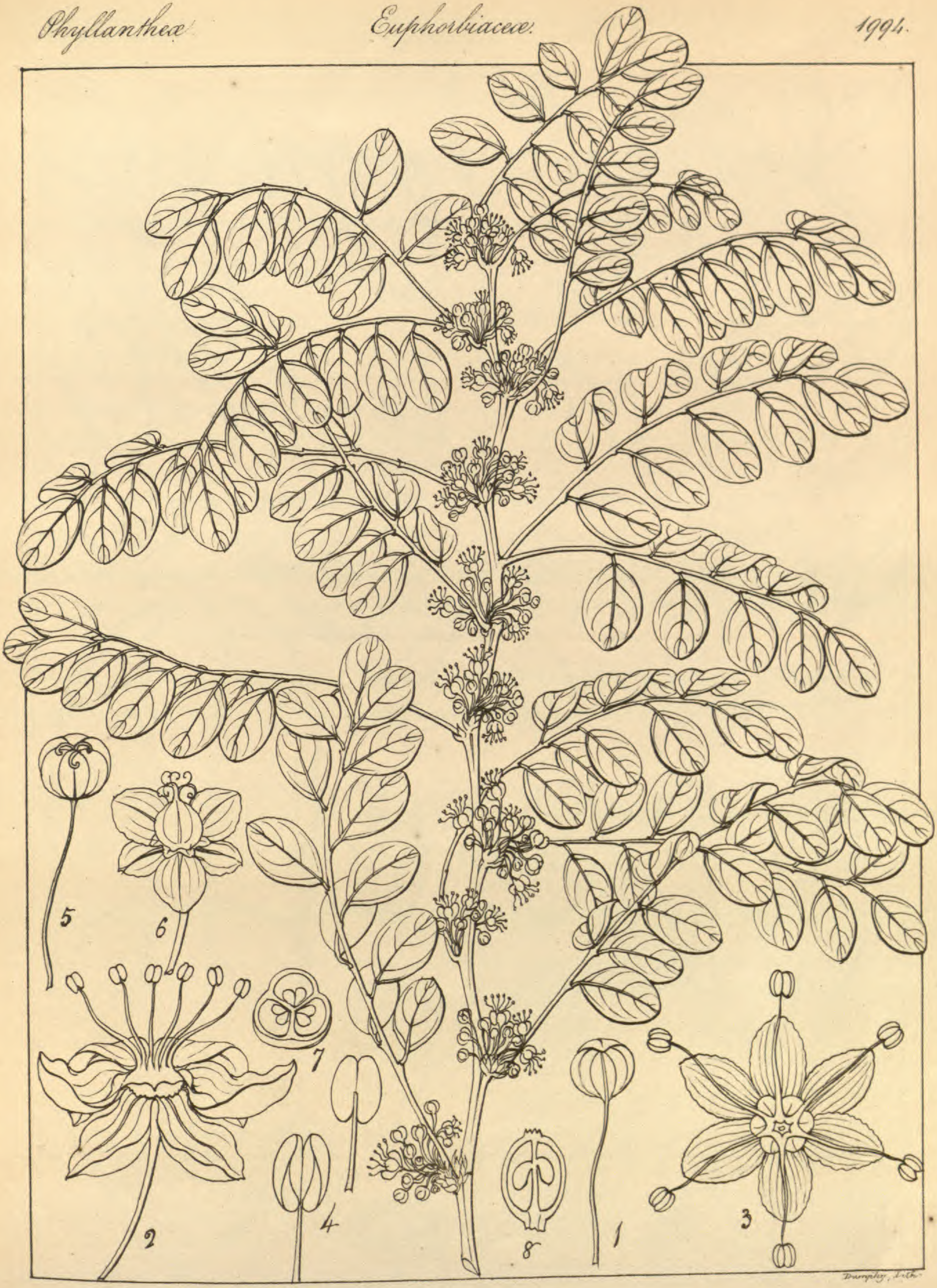
Antidesma acuminata (Wall: m: s. s)



Astylis venusta (R. W.)

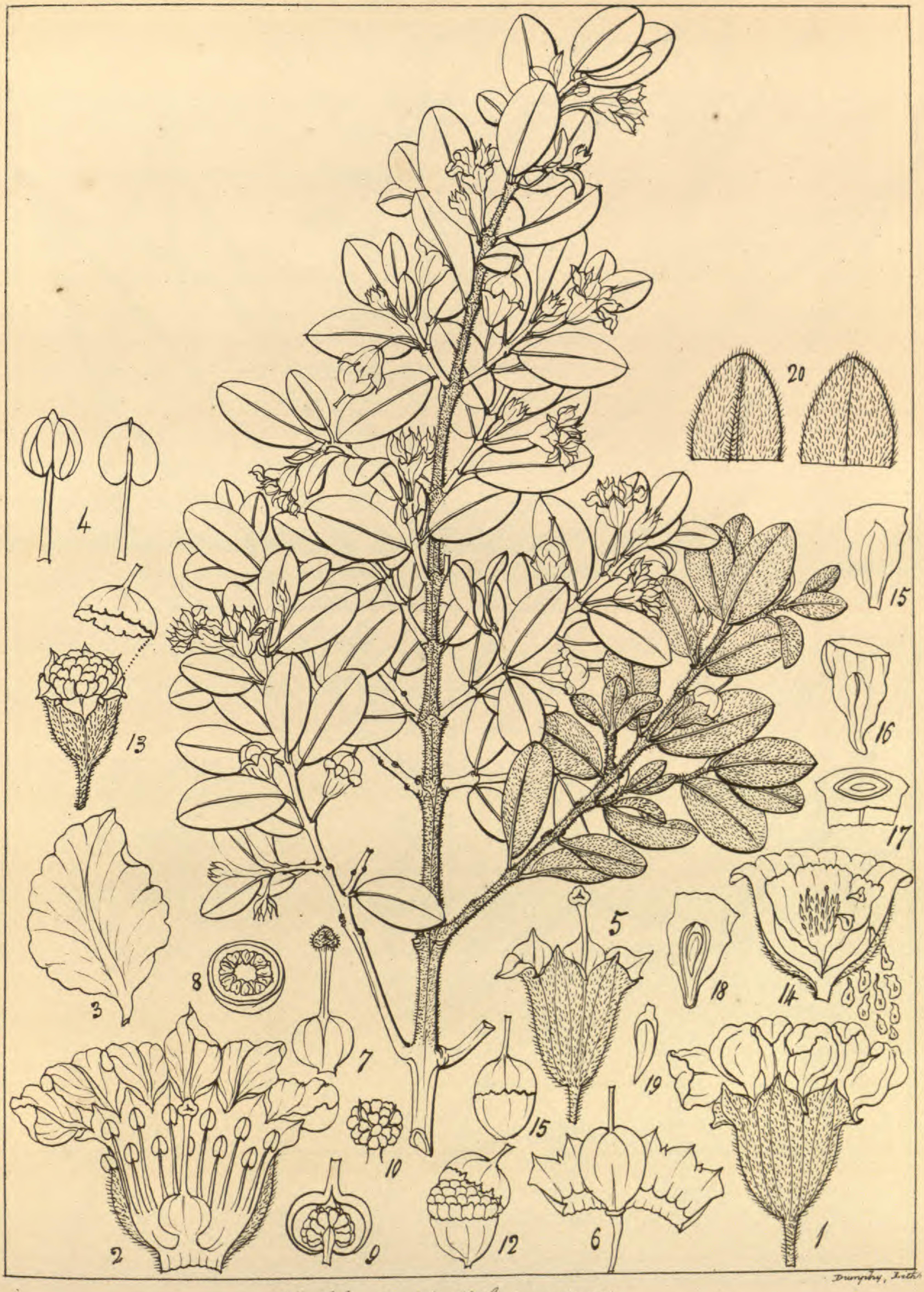


Euphorbia Cattimandoo (W. Elliot)



Chorisandra pinnata (R. W.)

Wagatea spicata (Dalzell)



Maclelandia Griffithiana (R.W.)

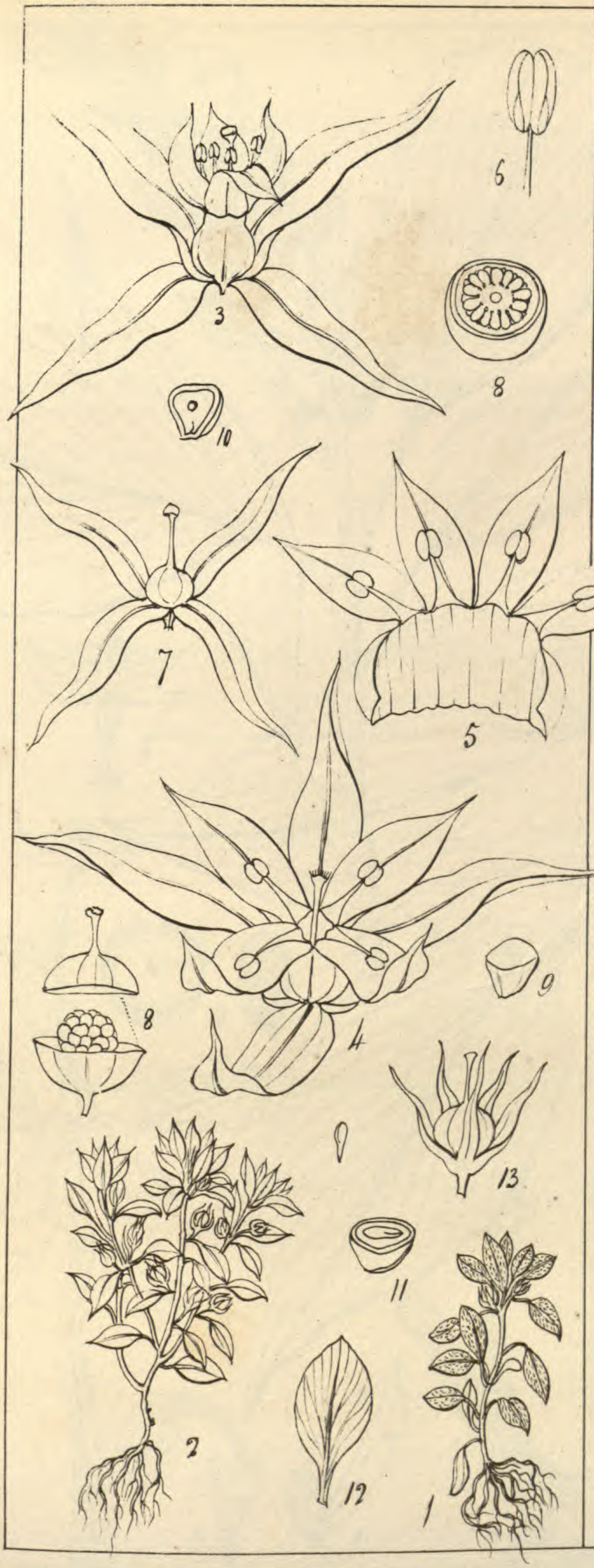
Kotonia floribunda (R.W.)

Hortonia ovalifolia (R.W.)

H. acuminata (R.W.)

Dumphy, Lith.

Calysaccion longifolium (R.W.)



Centunculus tenellus (Dalz.)

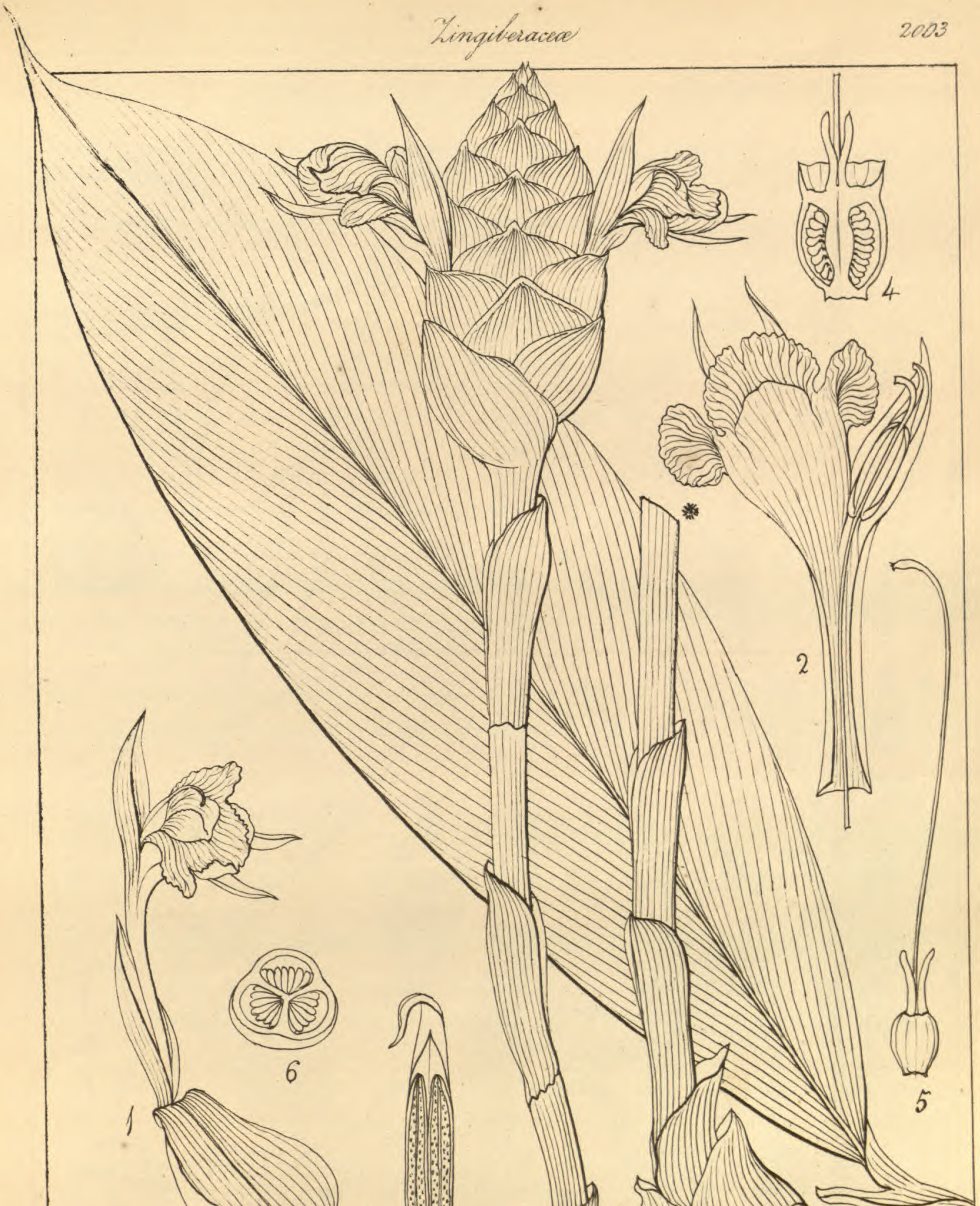
Dunphy, Lith.

Primula denticulata (J.E. Smith)

Globba marantina (Willd.)

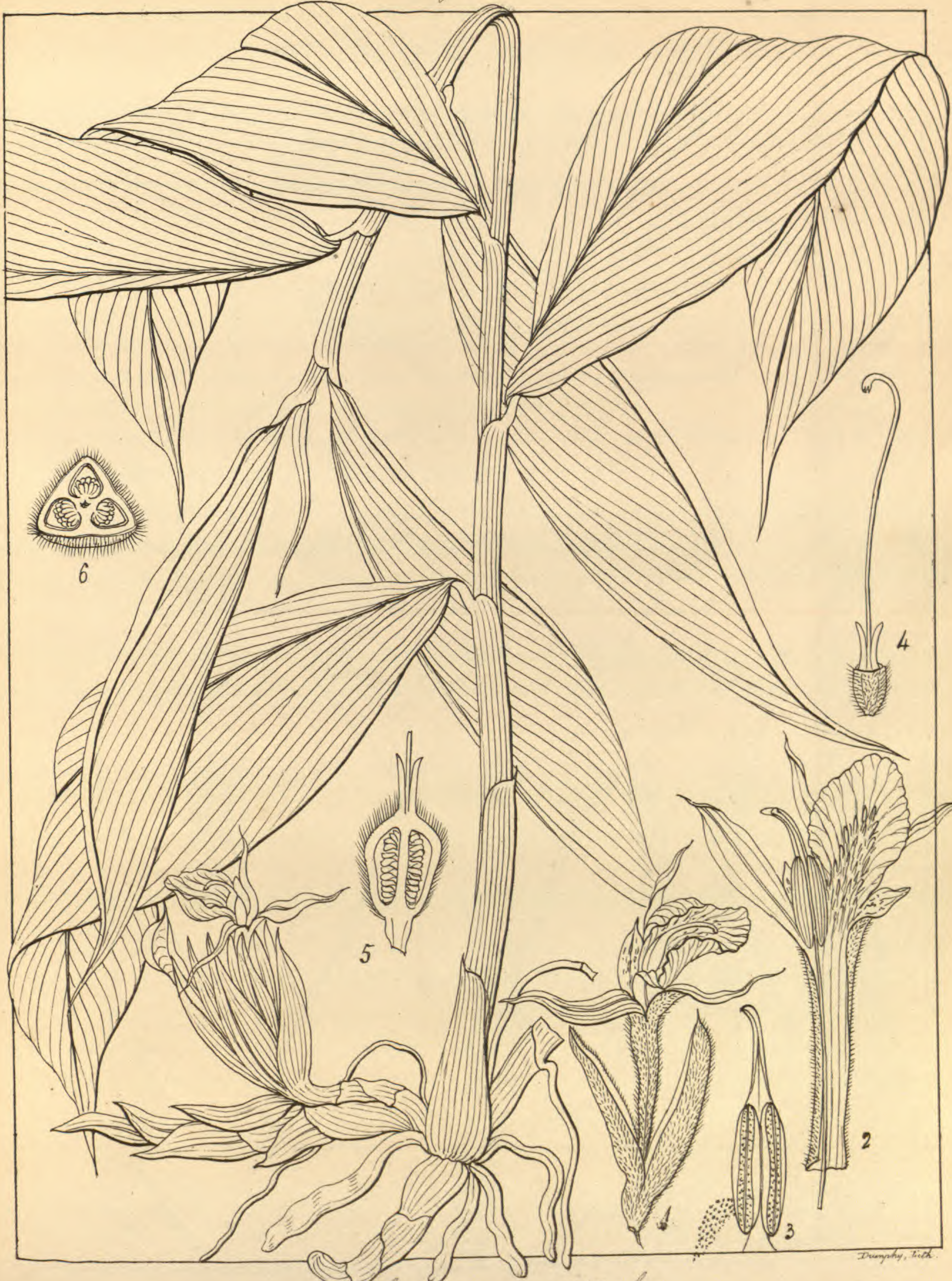
Dumphy, Lith.

Globba ophioglossa (R.W.)



Dunphy, Lith

Zingiber zerumbet (J.E. Smith)



Zingiber squarrosum? (Roxb)

Curcuma aromatica (Salisb.)

Curcuma Neilgherrensis (R.W.)

Dunphy Lith.

Elettaria cannæcarpa (R.W.)

Hedychium flavescens (Roscoe)

Dunphy, Lith

Hedychium coronarium (Willd)

Hedychium cernuum (R.W.)

Hedychium venustum (R. W)

Dunphy, lith.

Roscoea alpina (Royle.)

Roscoea lutea (Royle.)

Costus speciosus (Smith)

Maranta virgata (Wall.)

Dumphy, Lith.

Phrynium capitatum (Willd.)

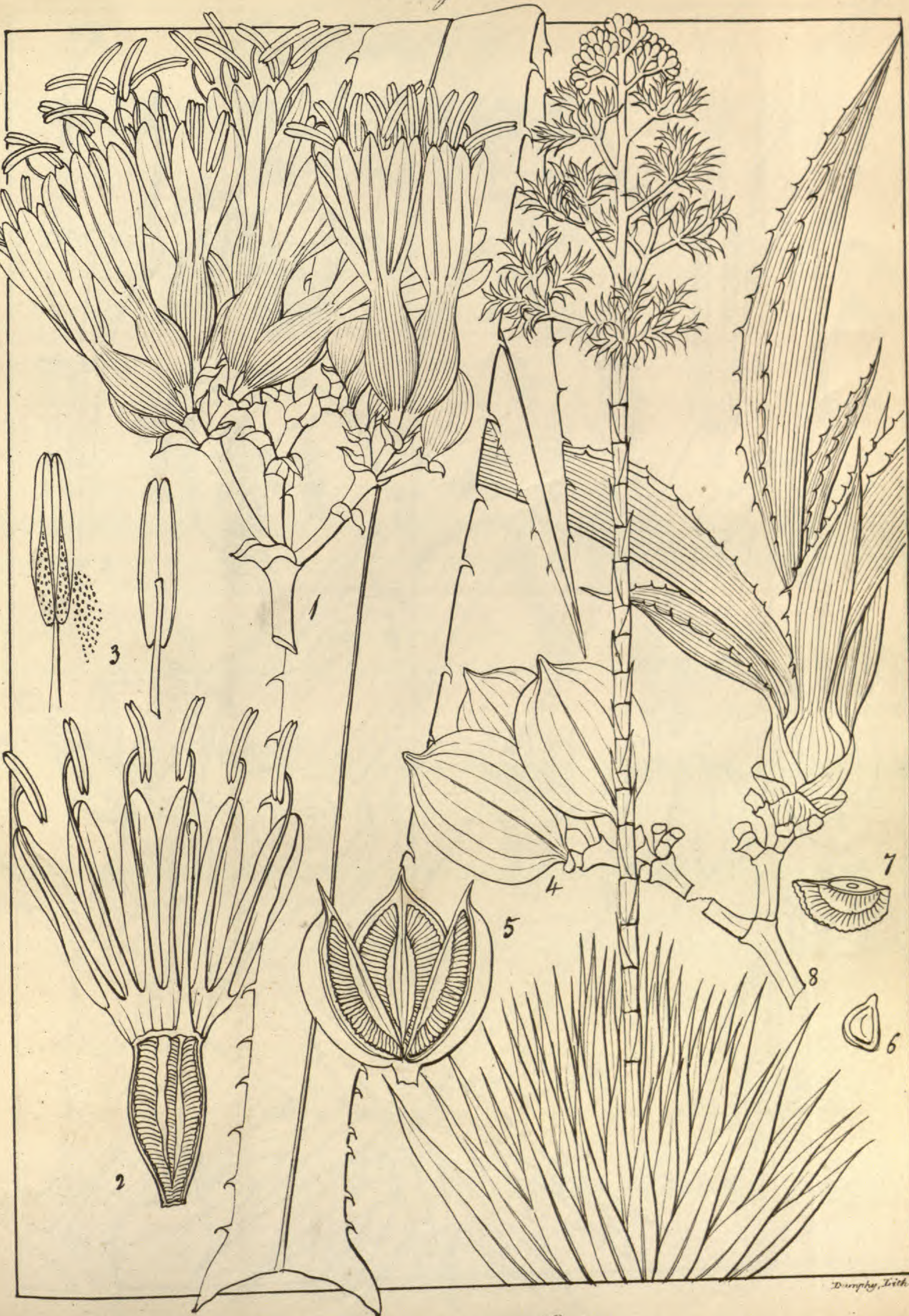
Musa superba (Roxb.)

Crinum latifolium.

Dunphy, Lith.

Crinum toxicarum (Roxb)

Pancratium verecundum (Soland)



Dunphy, Lith.

Dumphy, Lith.

Fourcroya gigantea (Vent.)

Alpinia Rheedii (R.W.)

Alpinia nutans (Roscoe)

Dunphy, Lith.

Alpinia nutans (Rosc.)
calcarata

Kæmpferia rotunda (Willd.)

Kæmpferia ....?

Dunphy, lith.

Monolophus scaposus (Dalz.)

Dumphy, Lith.

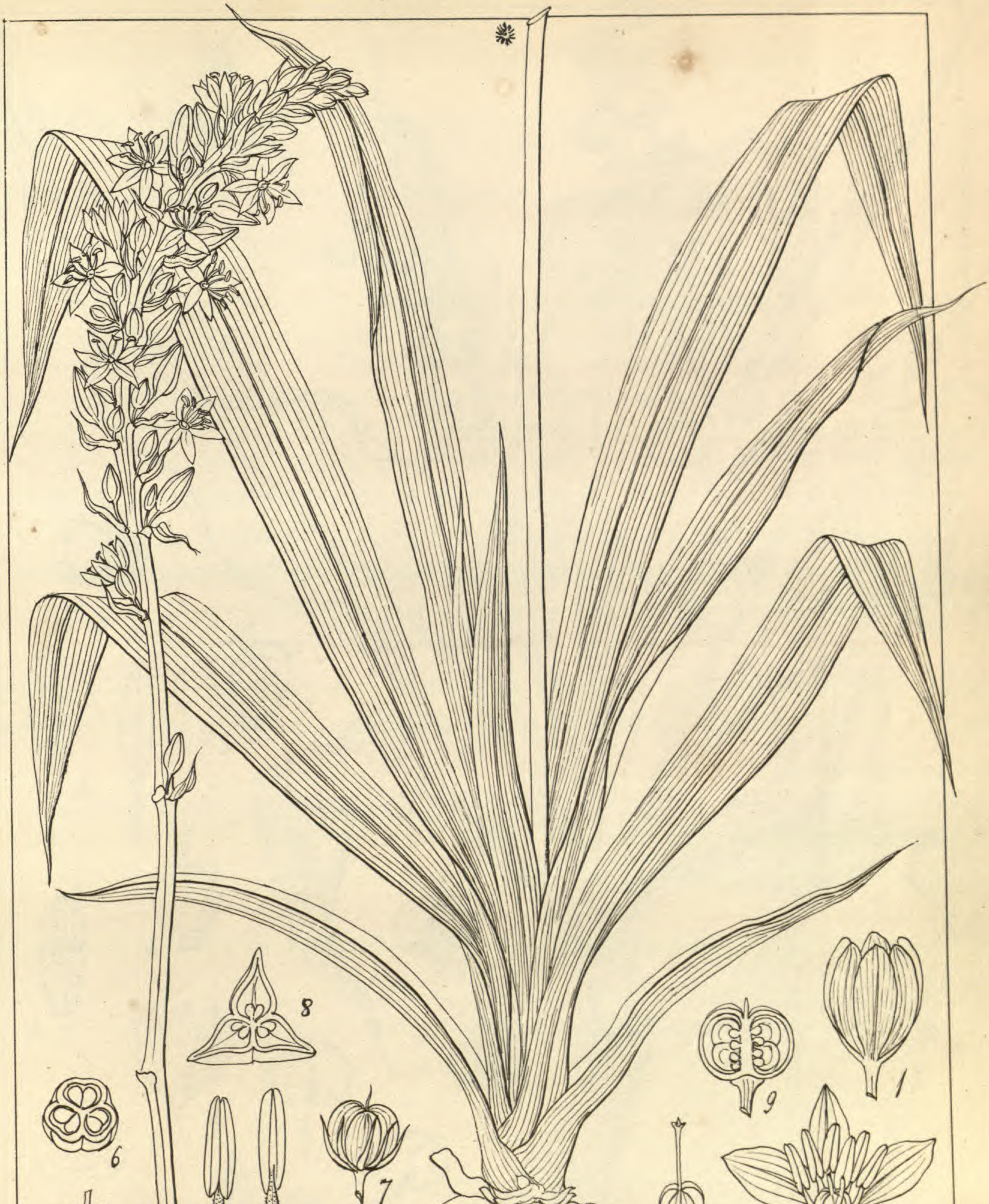
Lilium Neilgherrense (R.W.)

Lilium tubiflorum (R.W.)

Dumphy, Lith.

Lilium Wallichianum? (Rœm. & Sch.)

Phalangium tuberosum (Kunth.)



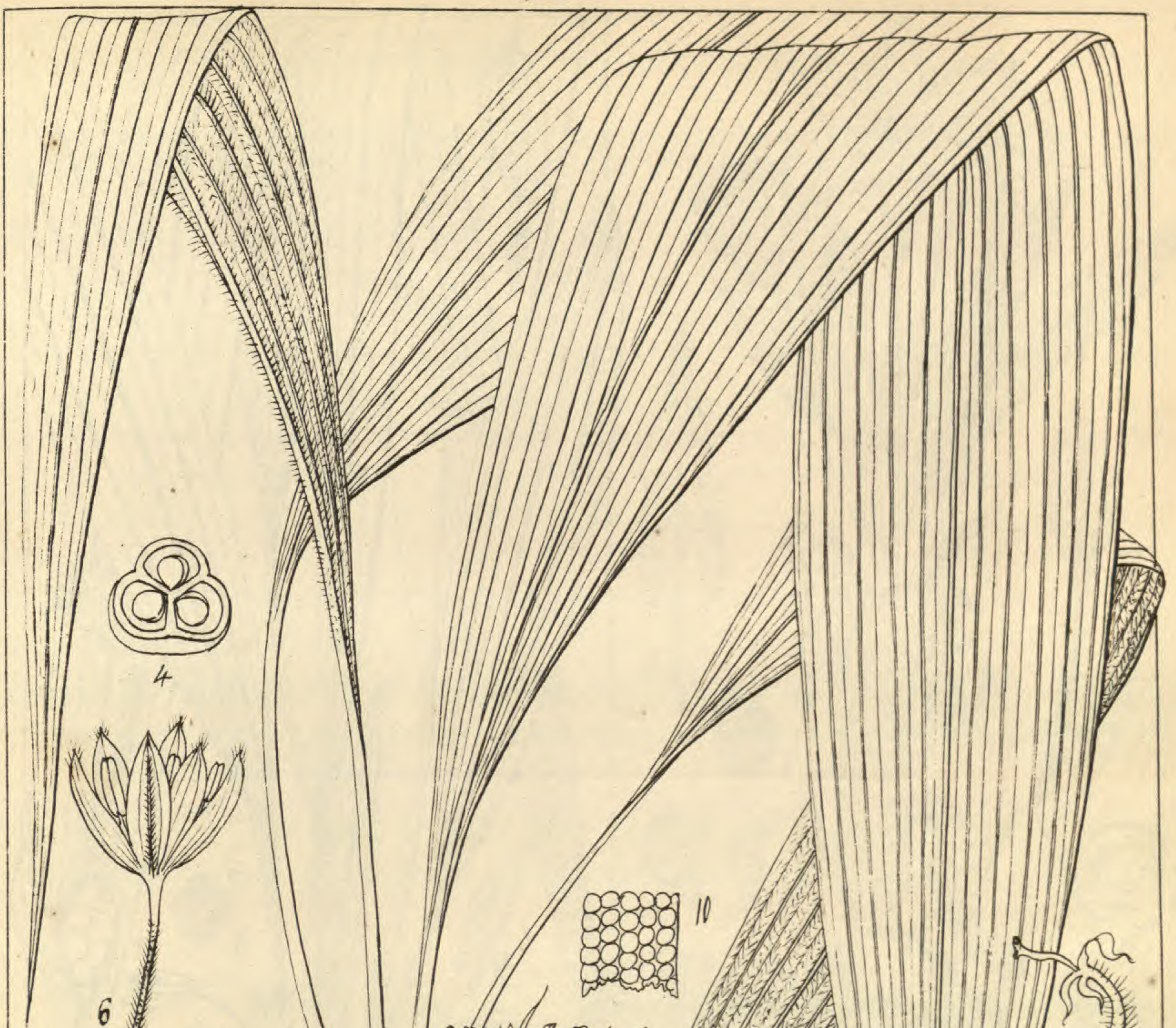
Phalangium attenuatum (R.W.)

Phalangium ? oligospermum (R.W.)

Phalangium? parviflorum (R.W.)

Ledebouria hyacinthina (Roth.)

Barnardia Indica (R.W.)



Curculigo sumatrana (Roxb. Loddeg.)

Curculigo Malabarica (R.W.)

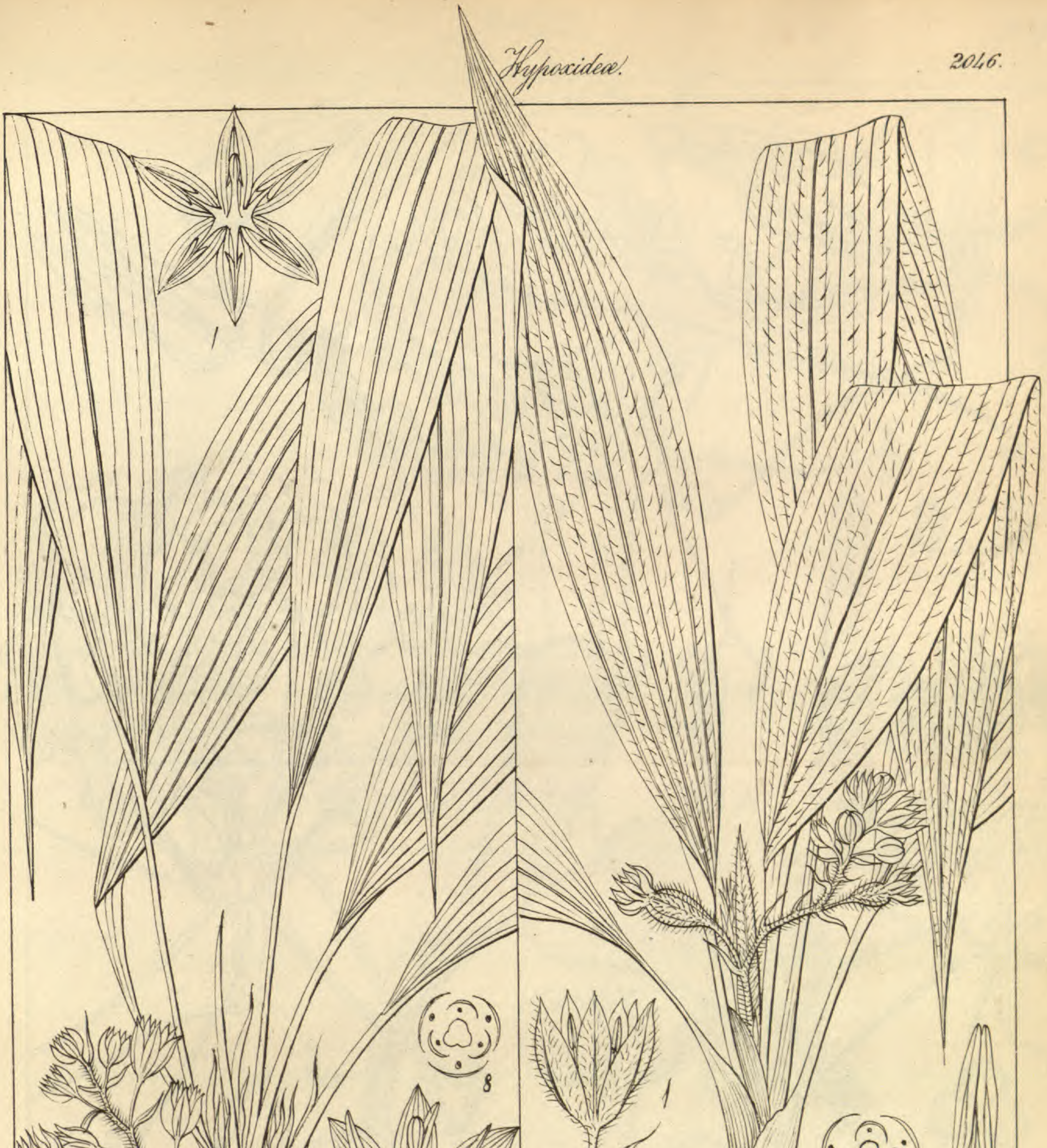
Curculigo brevifolia (Aiton.)

Dumphy, Lith.

Hypoxis latifolia (R.W.)

Hypoxis trichocarpa (R.W.)

Hypoxis leptostachya (R.W.)



Hypoxis pauciflora (R.W.)

Hypoxis brachystachya (R.W.)

Gloriosa superba (Lin.)

Dumphy, lith.

Disporum Leschenaultianum (Don.)

Dunphy Lith.

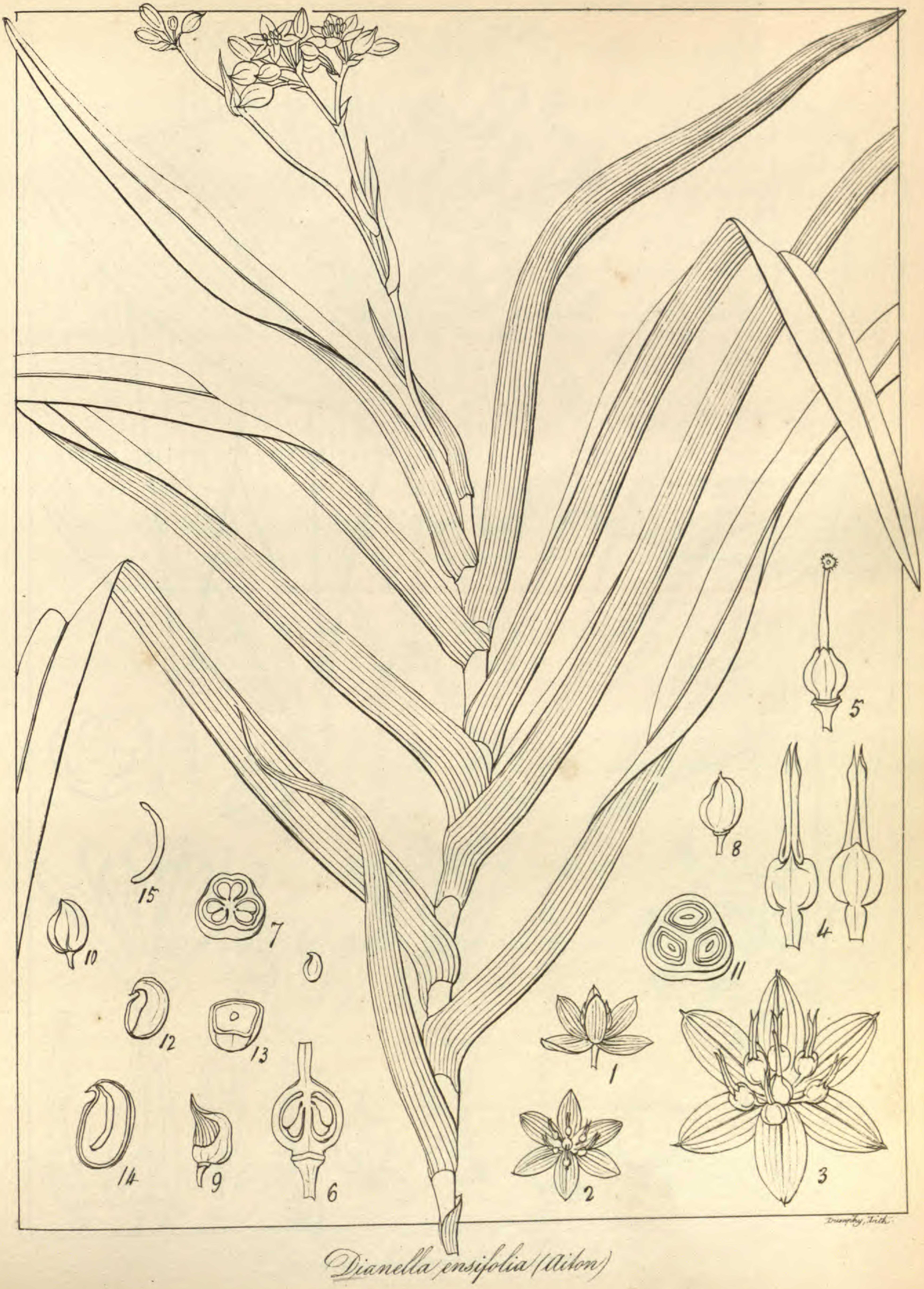
Disporum mysorense (R.W.)

Disporum Ceylanicum (R.W.)

Ophiopogon Indicus (R.W. Rott?)

Peliosanthes courtallensis (R. W.)

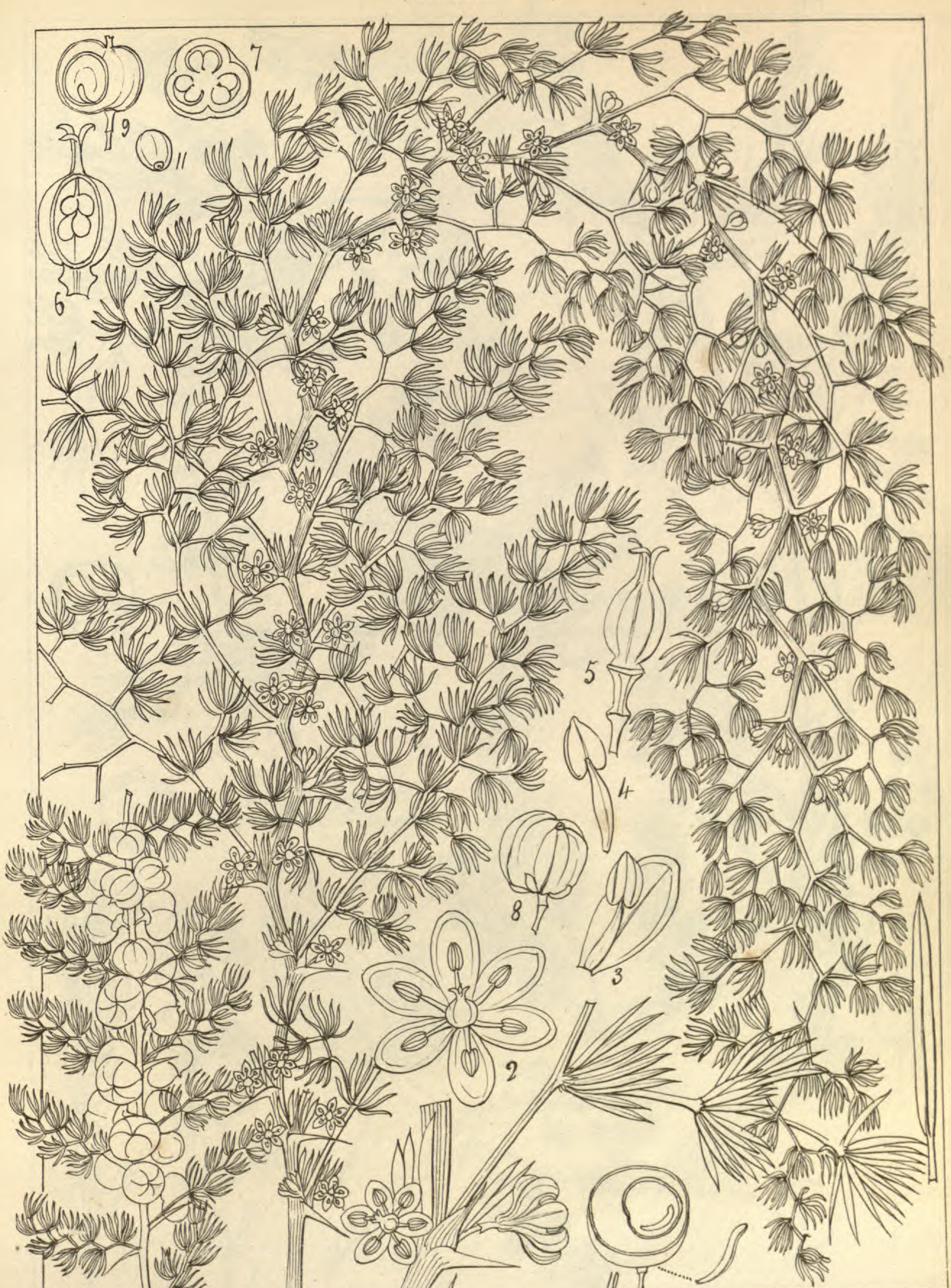
Peliosanthes neilgherrensis (R.W.)



Dunphy, lith.

Dianella ensifolia (Aiton)

Dracaena terminalis (Linn:)



Dunphy, Lith.

Asparagus asiaticus (Linn)

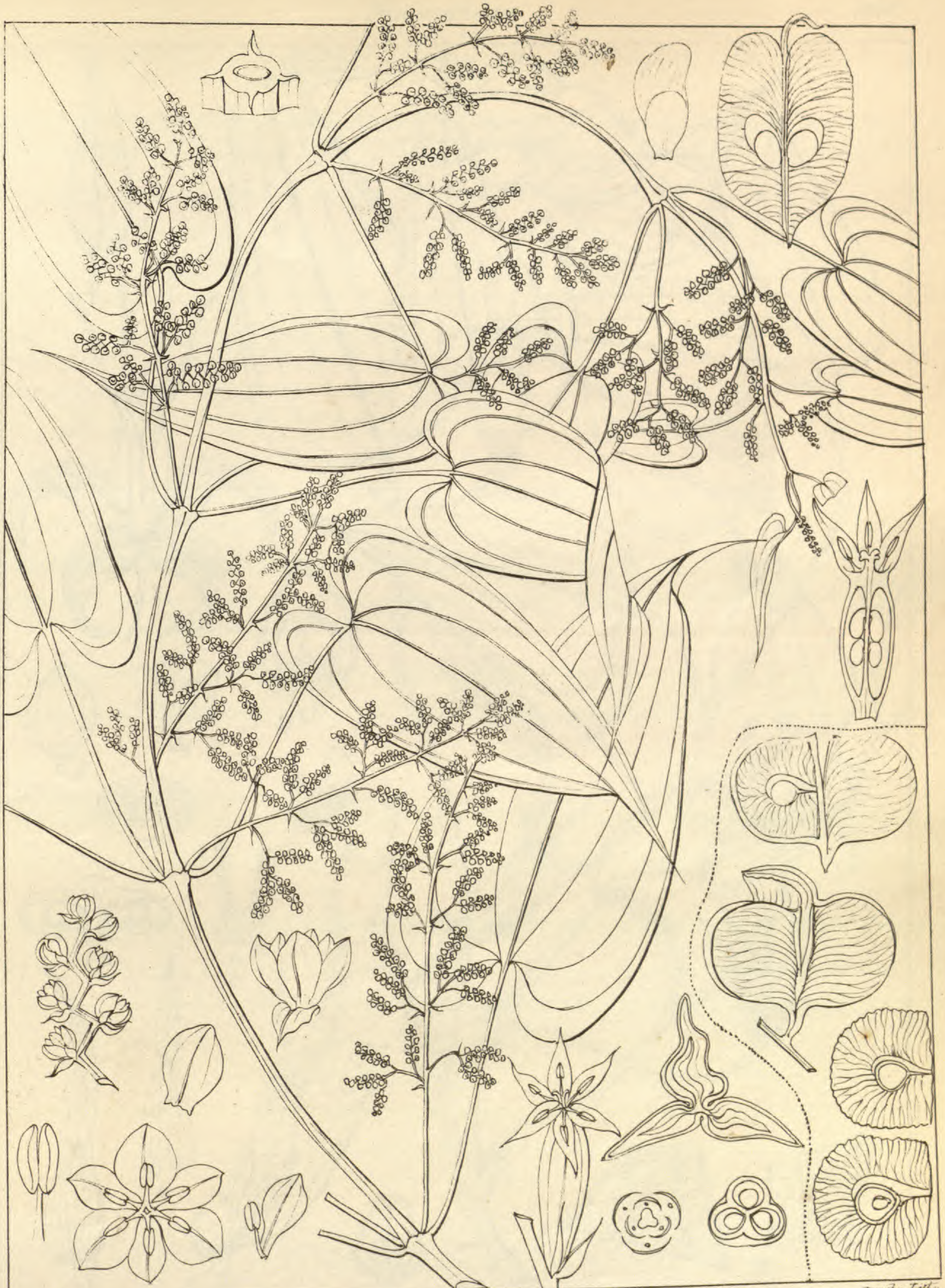
Asparagus racemosus (Willd.)

Smilax zeylanica ♀ (Linn)

Dumphy, Lith.

Smilax zeylanica ♂ (Linn.)

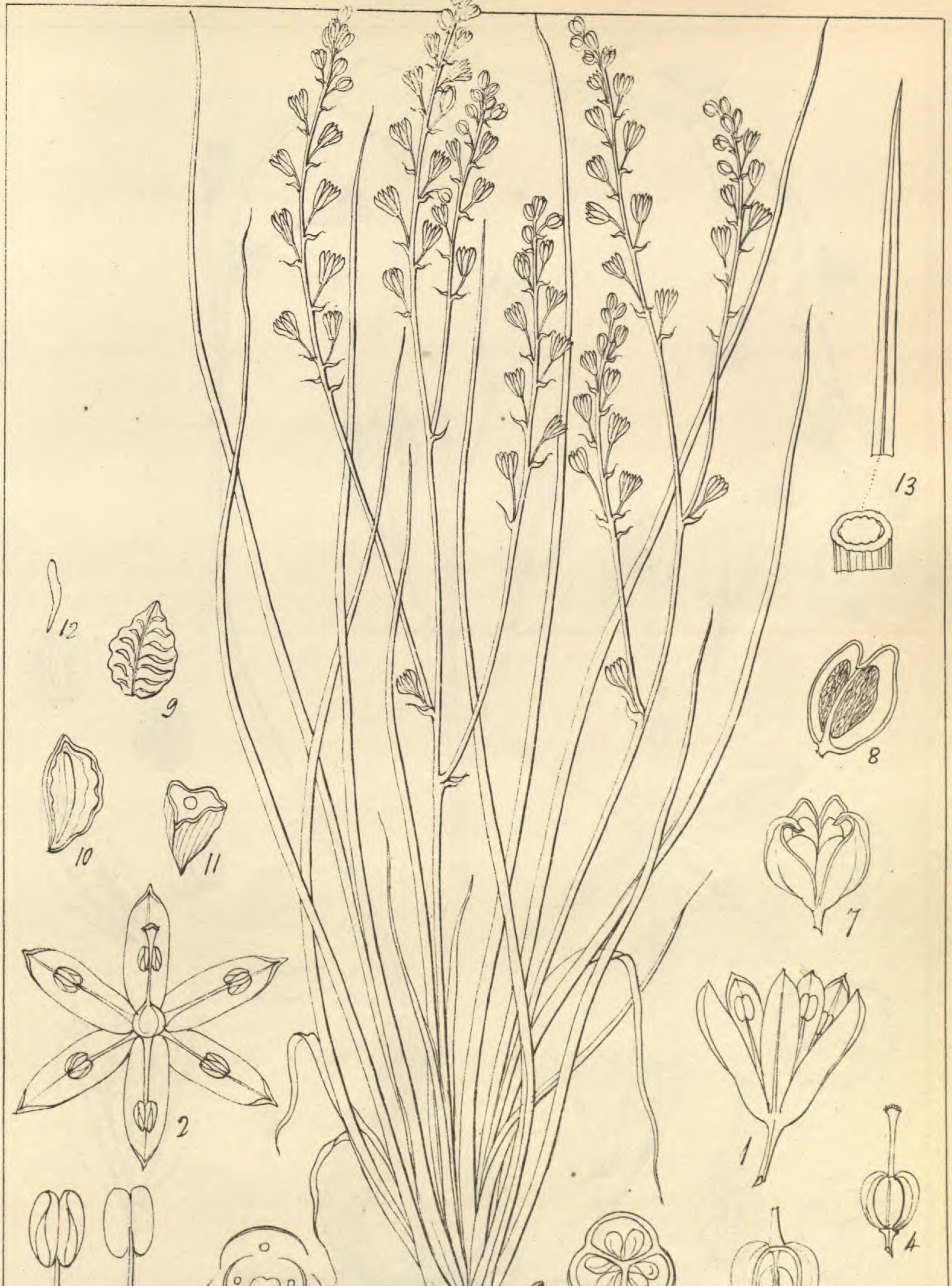
Smilax maculata (Roxb.)



Dioscorea aculiata (Linn)

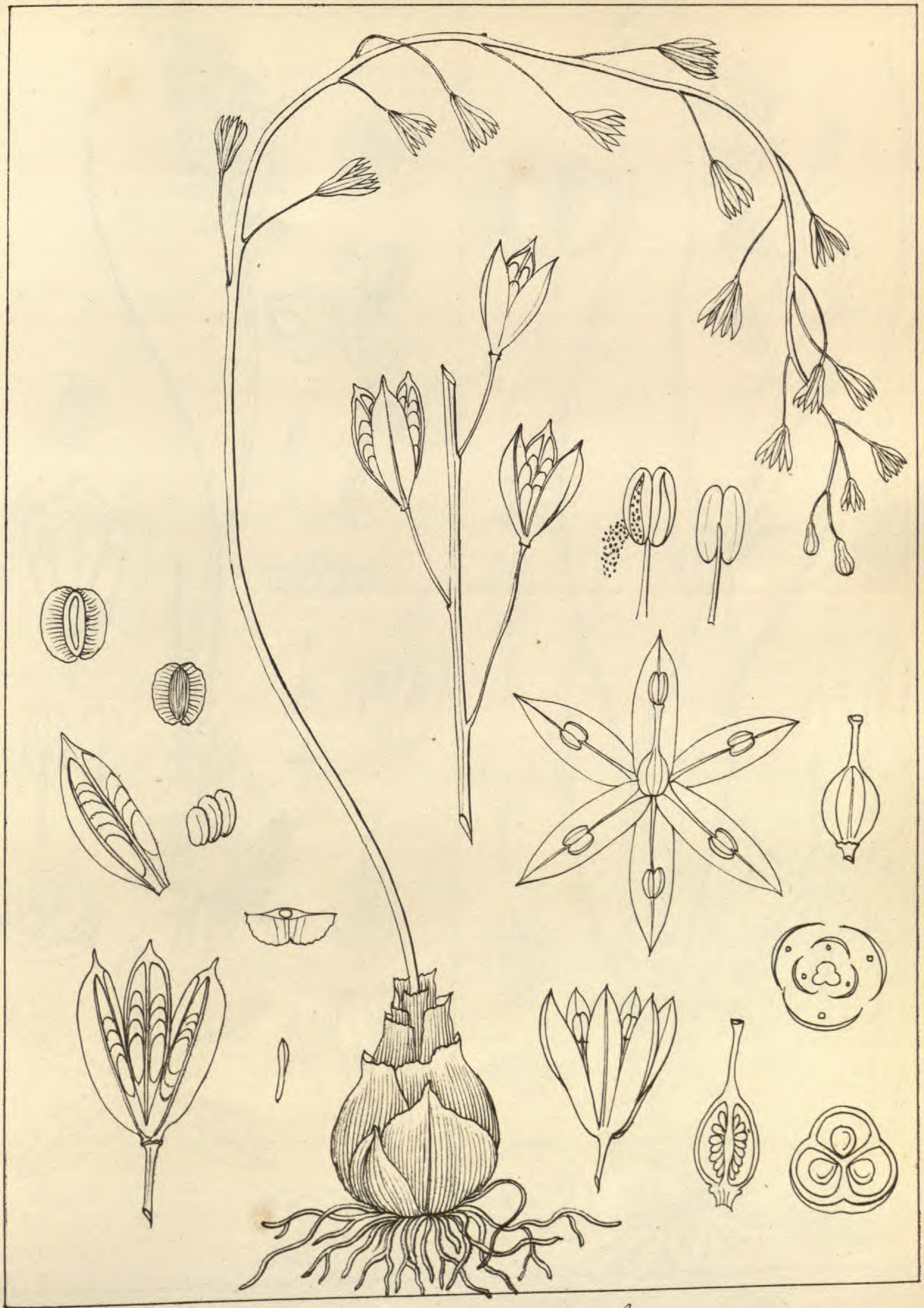
Dunphy, Lith.

Roxburghia gloriosoides (Driand.)



Dumphy. Lith.

Asphodelus parviflorus (R.W.)

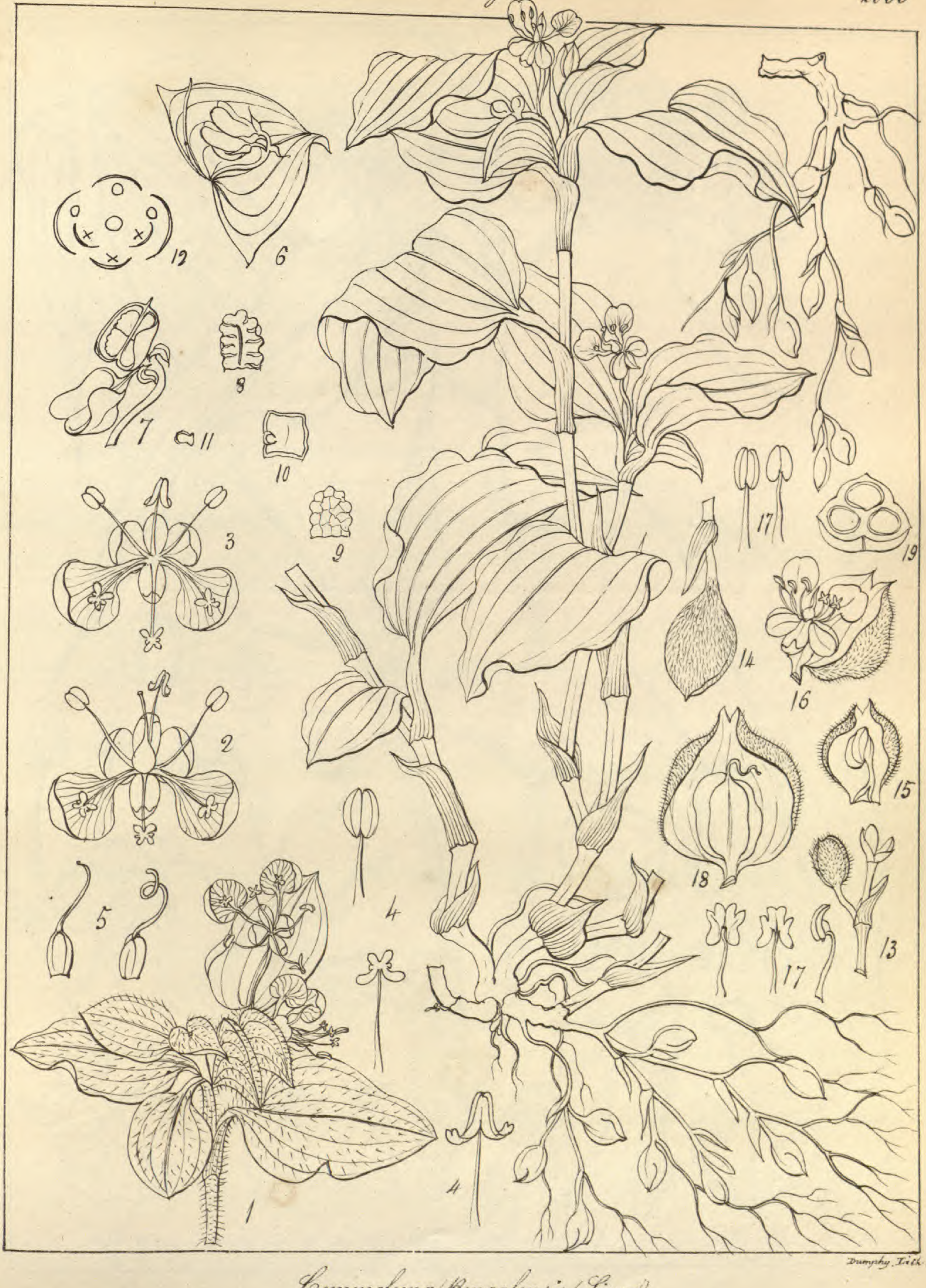


Urgenia Indica (Kunth.)

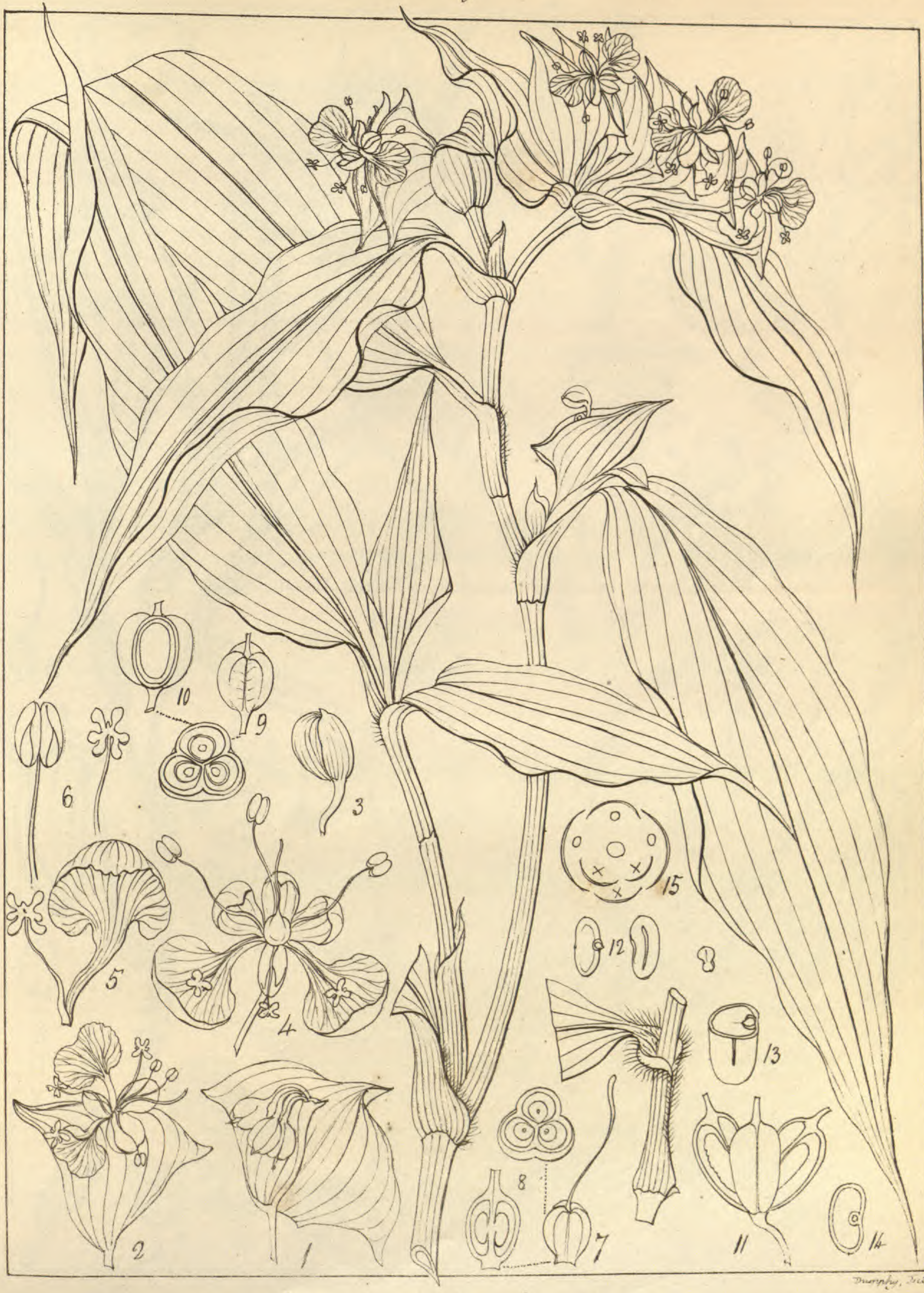
Dunphy. Lith

Urgenia congesta (R.W.)

Urgenia coromandelina (R.W.)



Commelyna Bengalensis (Linn)

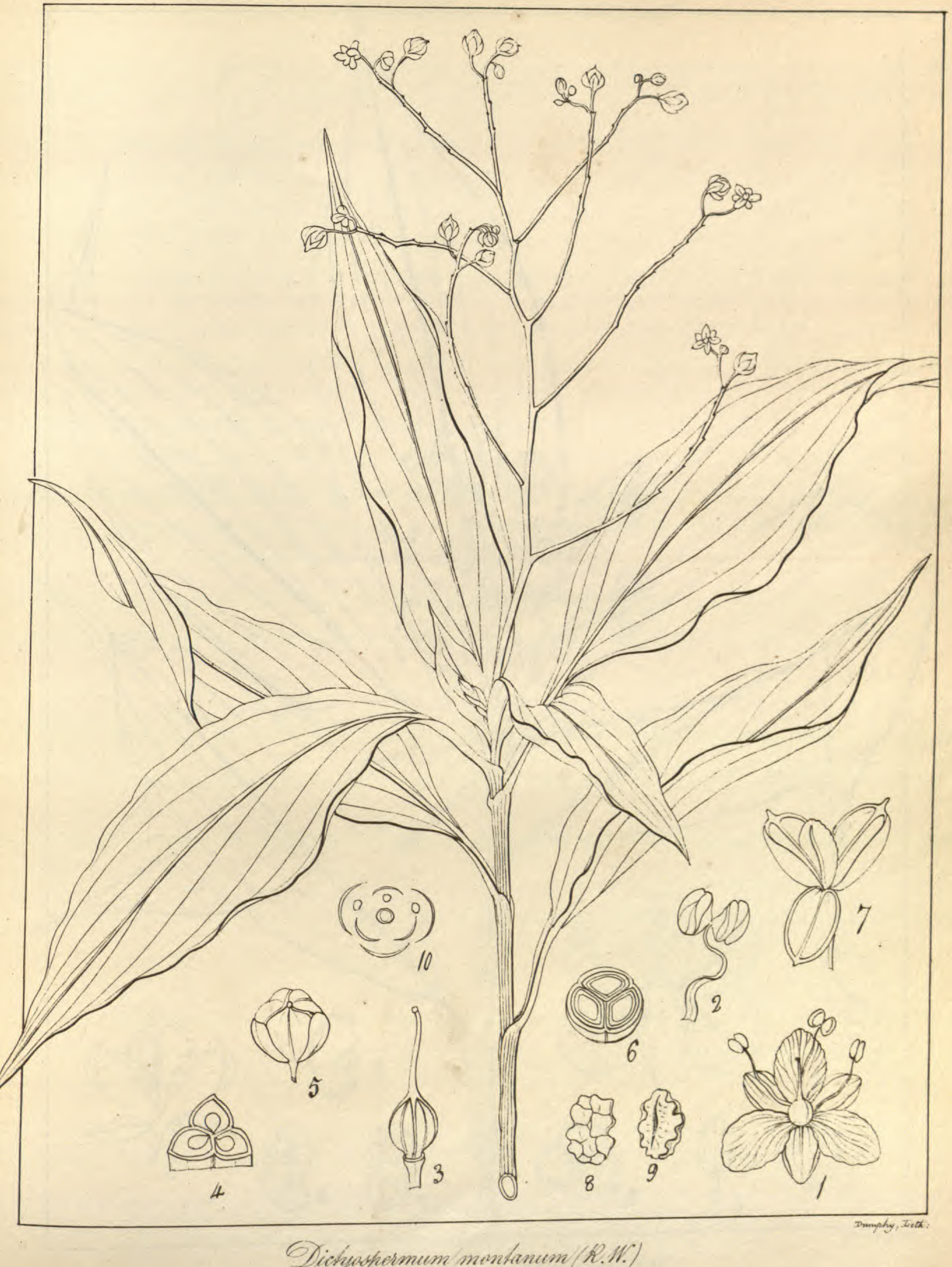


Dumphy, lith.

Commelyna polyspatha (R.W.)

Heterocarpus hirsutus (R.W.) *Heterocarpus glaber (R.W.)*

Aclisia Indica (R.W.)



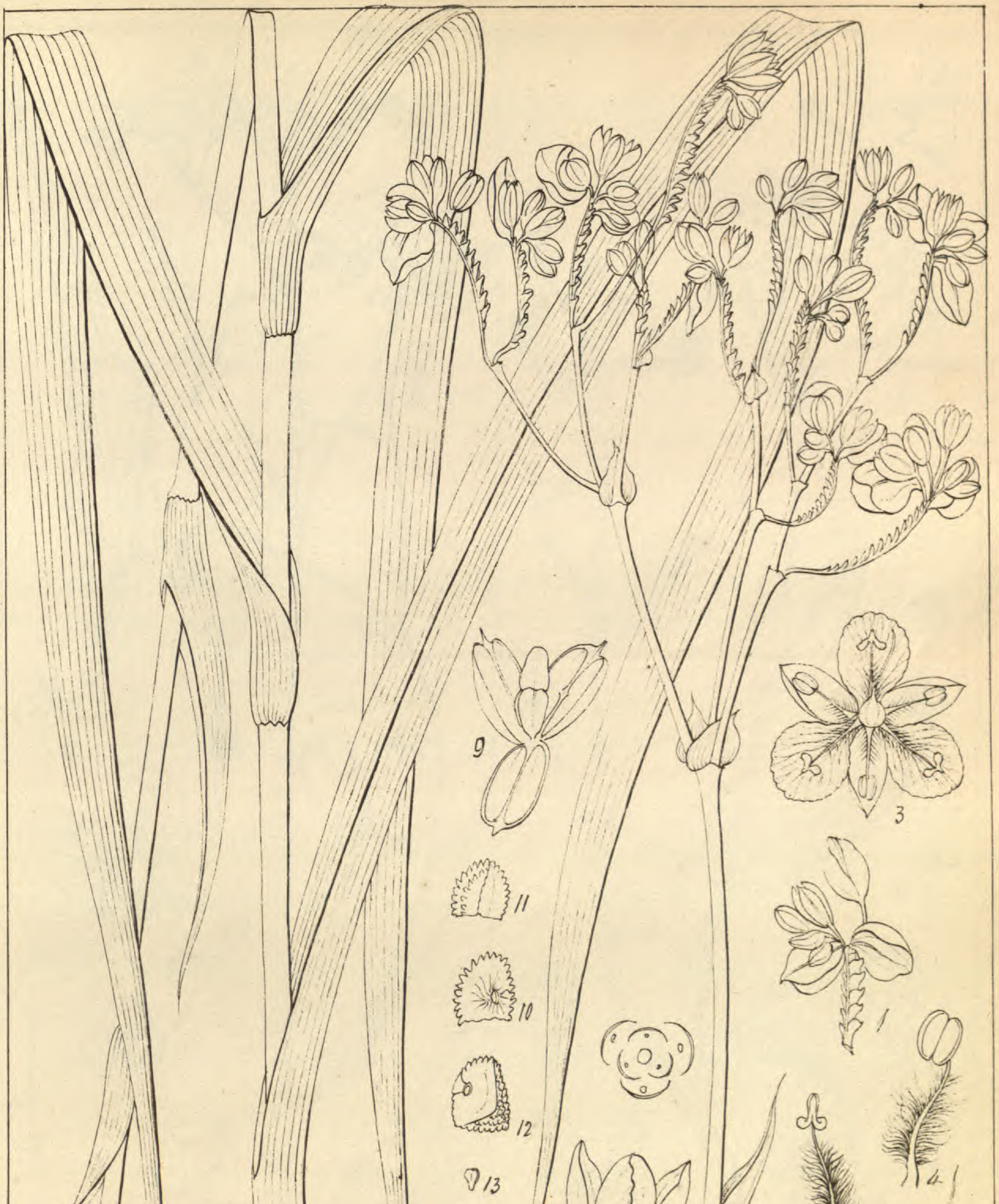
Dictyospermum montanum (R.W.)

Dictyospermum ovalifolium (R.W.)

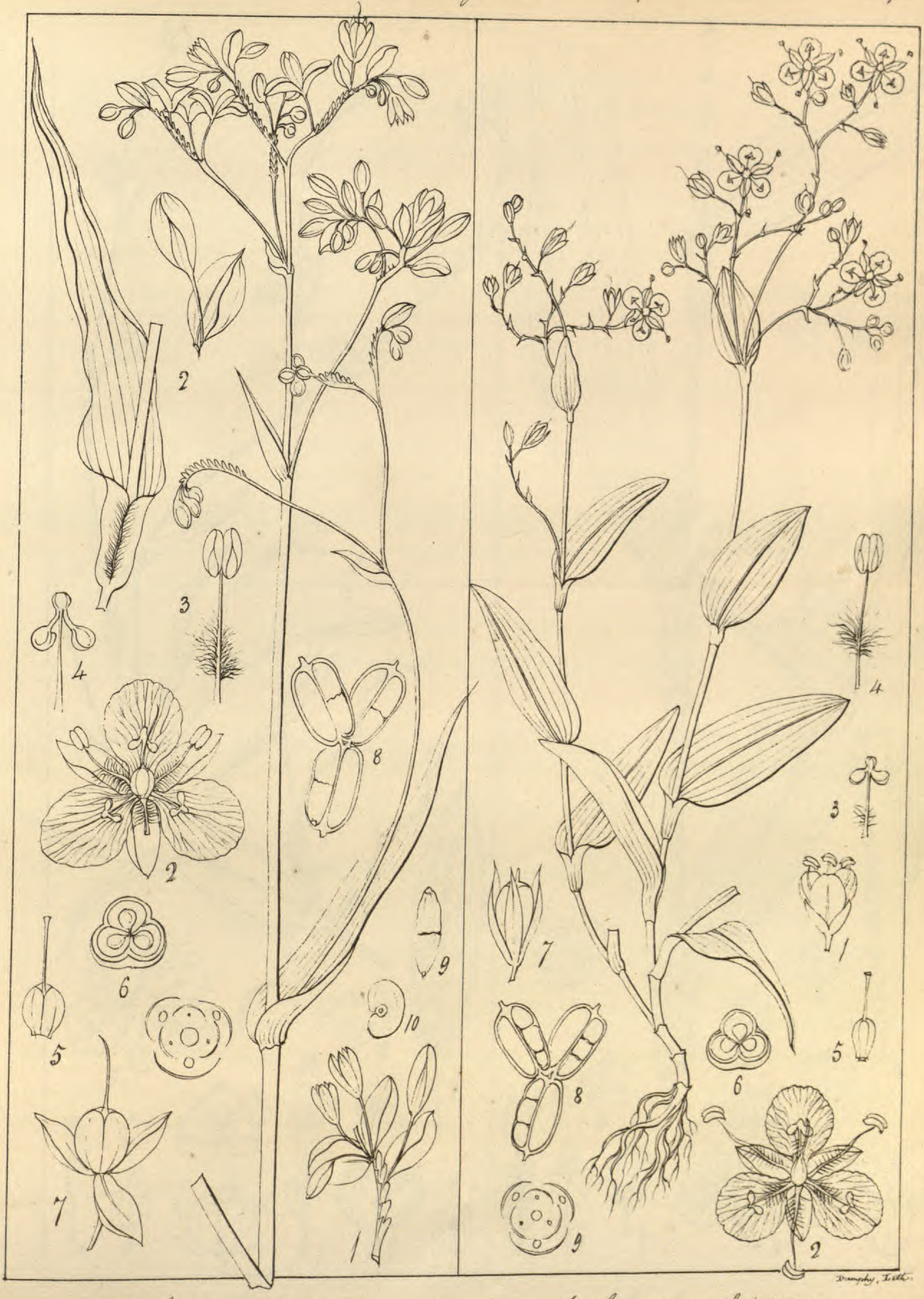
Dictyospermum protensum (R.W.)

Aneilema latifolia (R.W.)

Aneilema scapiflora (R.W.)

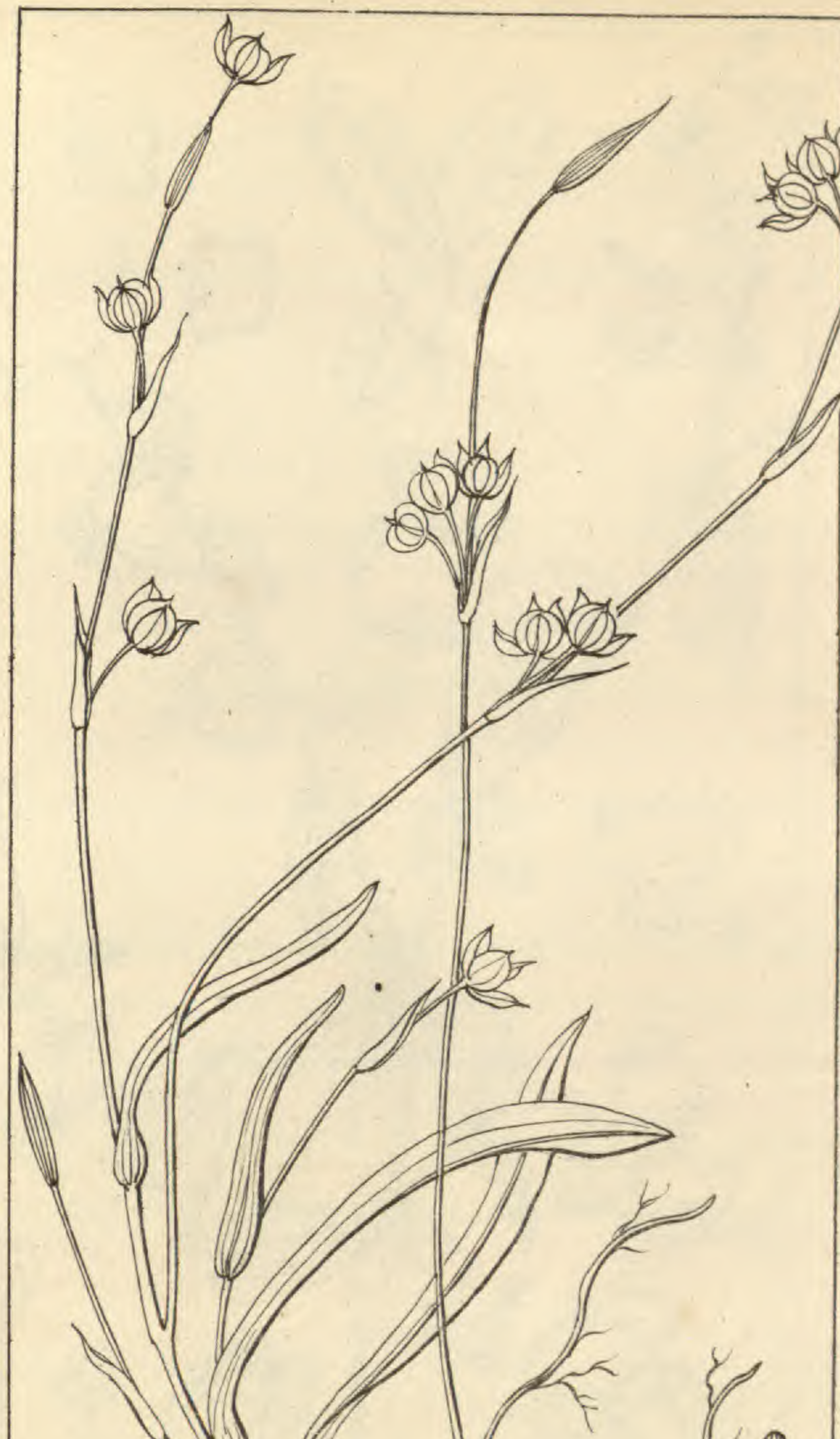


Aneilema ensifolia (R.W.)



Dumphy, Lith.

Aneilema secunda (R.W.) Aneilema paniculata (R.W.)

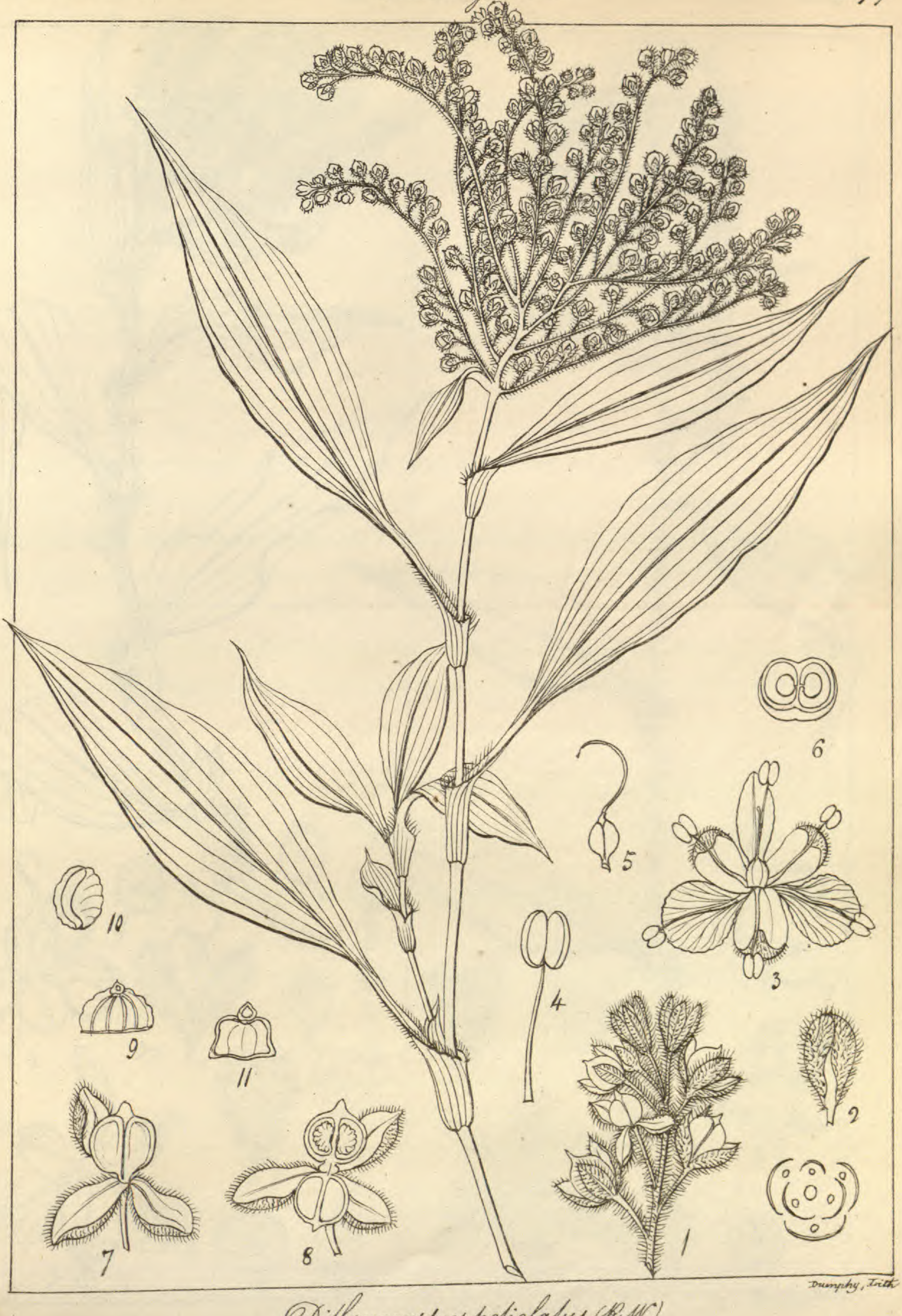


Aneilema vaginata (R.B.)

Aneilema terminalis (R.W.)

Aneilema pauciflora (R.W.) *Aneilema nana (Kunth)*

I *Dichæspermum lanceolata* (R. W.) II *Dichæspermum juncoides* (R. W.)
III *Dichæspermum repens* (R. W.)



Dumphy, Lith

Dithryocarpus petiolatus (R.W.)

Dithyrocarpus undulatus (R.W.) Dithyrocarpus Rothii (R.W.)

Dumphy, Lith.

Streptolirion volubile (Edgworth)

Cyanotis cristata (Ræm & Sch.)

Govindoo del. Dumphy Lith.

Cyanotis pilosa (Ræm. & Sch.)

Dumphy, Lith.

Cyanotis longifolia (R.W.)

Govindoo. Dumphy Lith.

Cyanotis lanceolata (R.W.)

Cyanotis rosea (R.W.)

Govindoo del. Dunphy Lith.

Cyanotis Lawiana (R.W.) *Cyanotis fasciculata (Ræm. & Sch.)*

Govindoo del.

Cyanotis sarmentosa (R.W.)

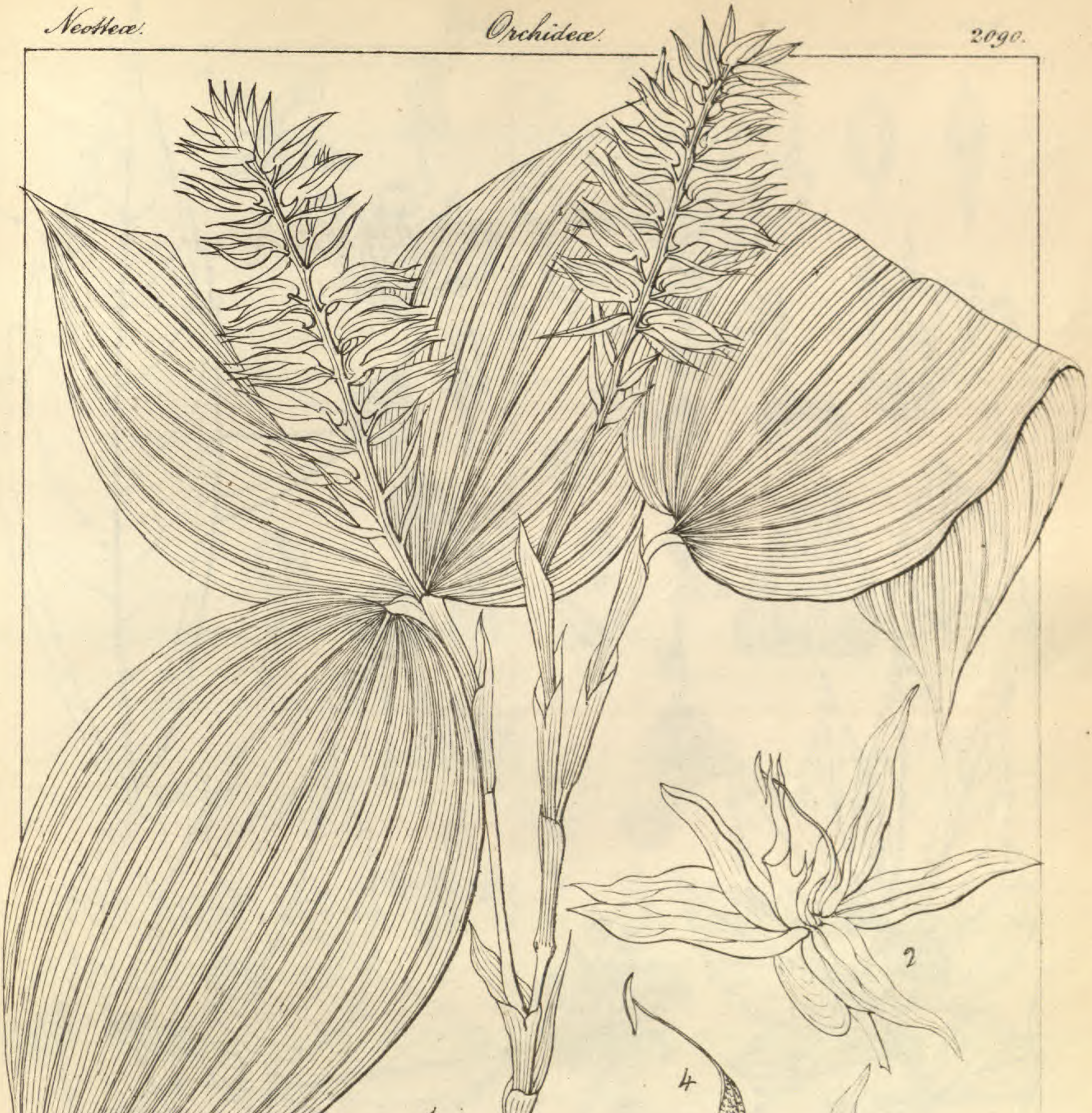
Cyanotis dichrotricha (Stocks Mss.)

Govindoo del. Dumphy Lith.

Cyanotis vaginata (R.W.) Cyanotis decumbens (R.W.)

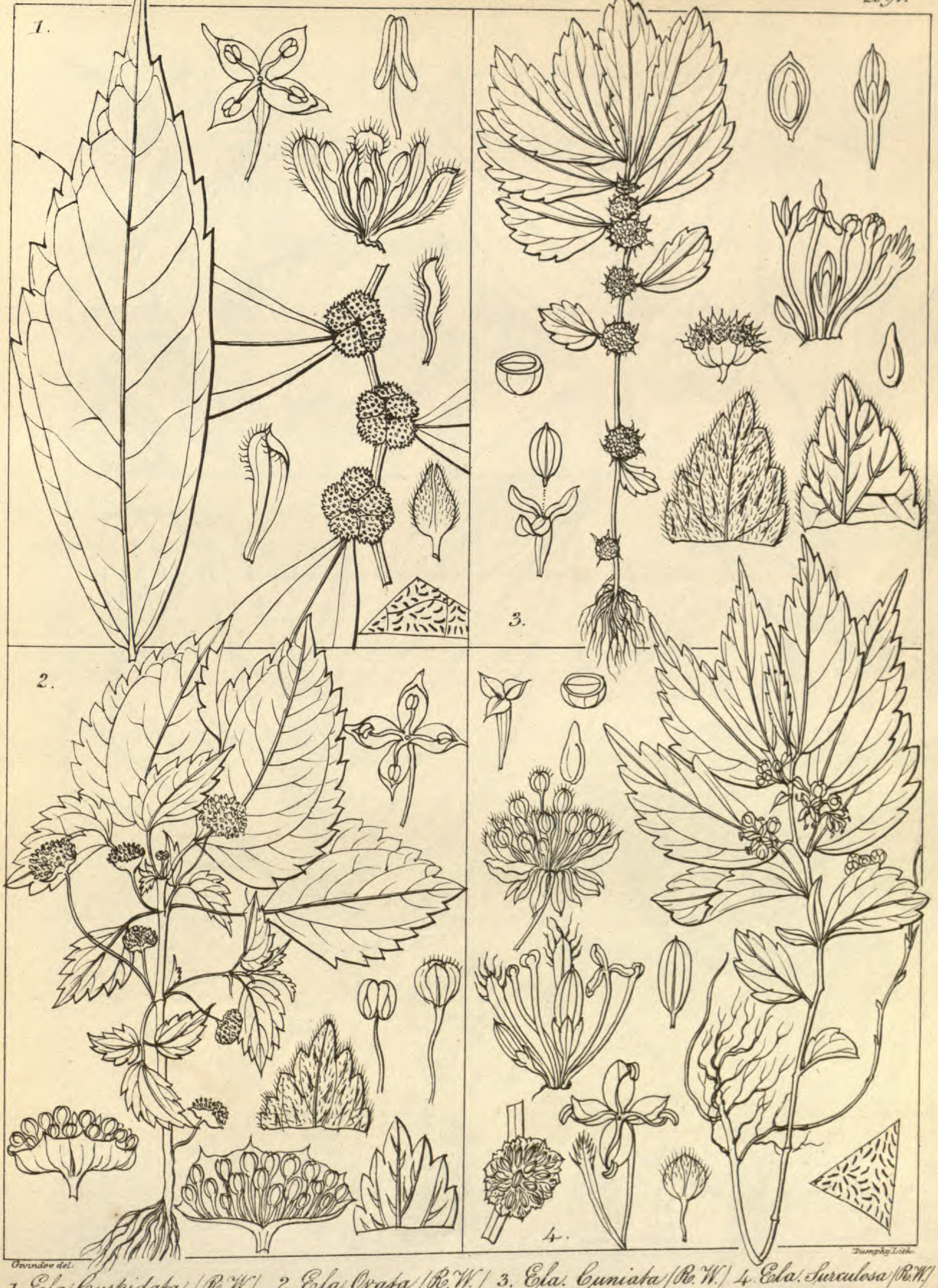
Govindoo del. Dumphy lith.

Cyanotis papilionaceæ (Roem. & Sch.) Cyanotis Burmanniana (R. W.)



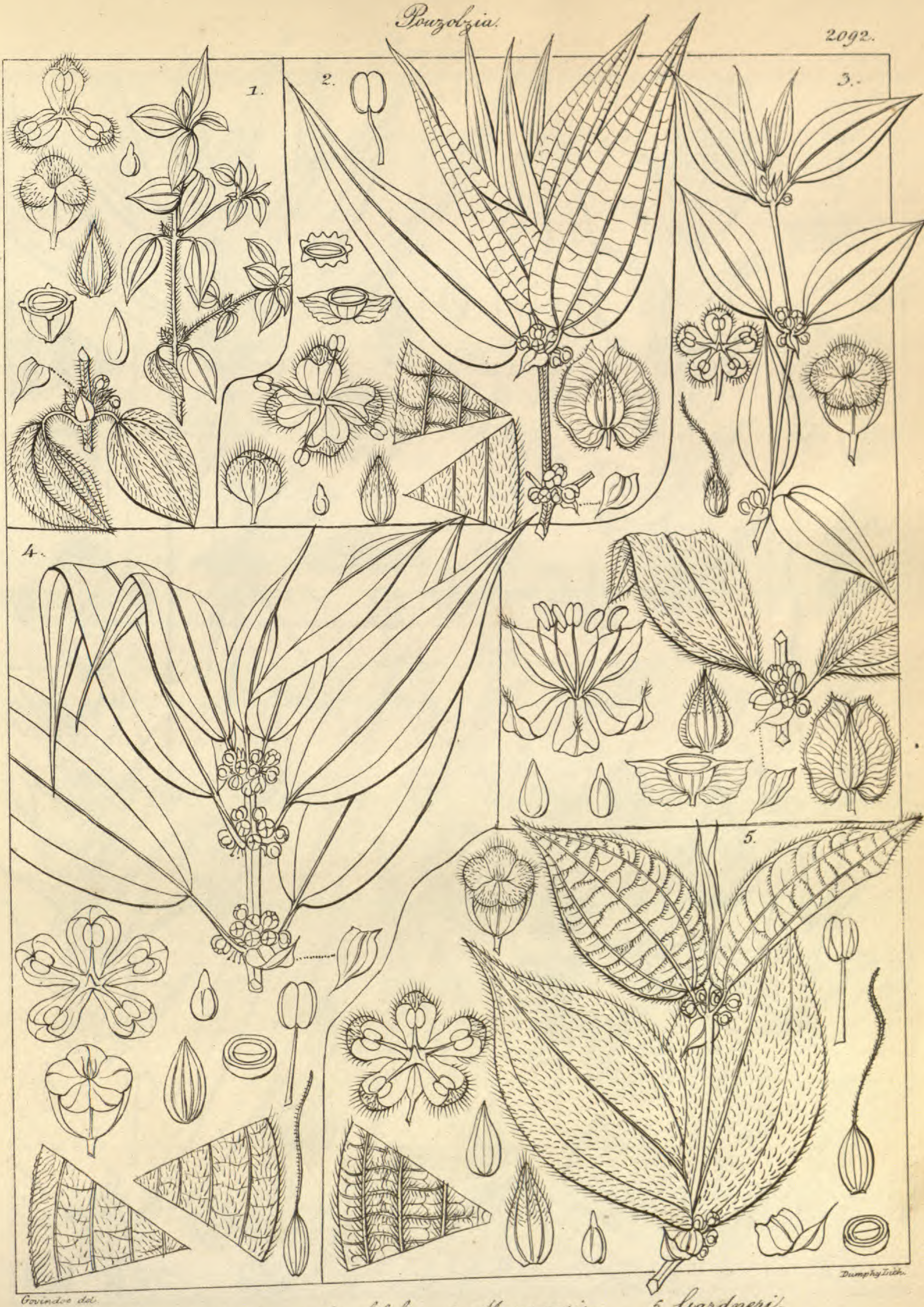
Govindoo del. Dumphy lith.

Govindooia nervosa (R. W.)

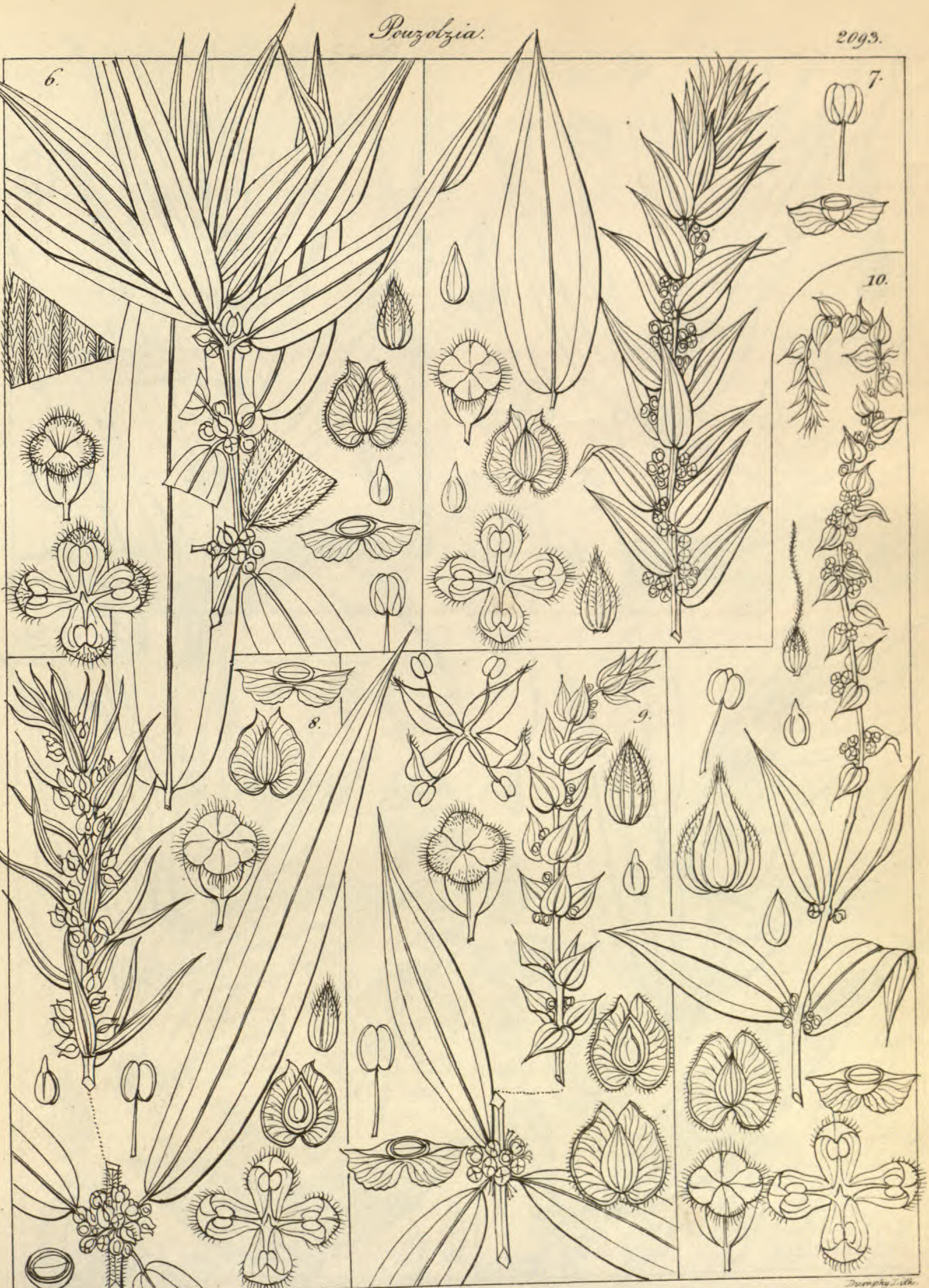


Govindoo del. Dunphy Lith.

1. *Ela. Cuspidata* (R. W.) 2. *Ela. Ovata* (R. W.) 3. *Ela. Cuniata* (R. W.) 4. *Ela. Surculosa* (R. W.)



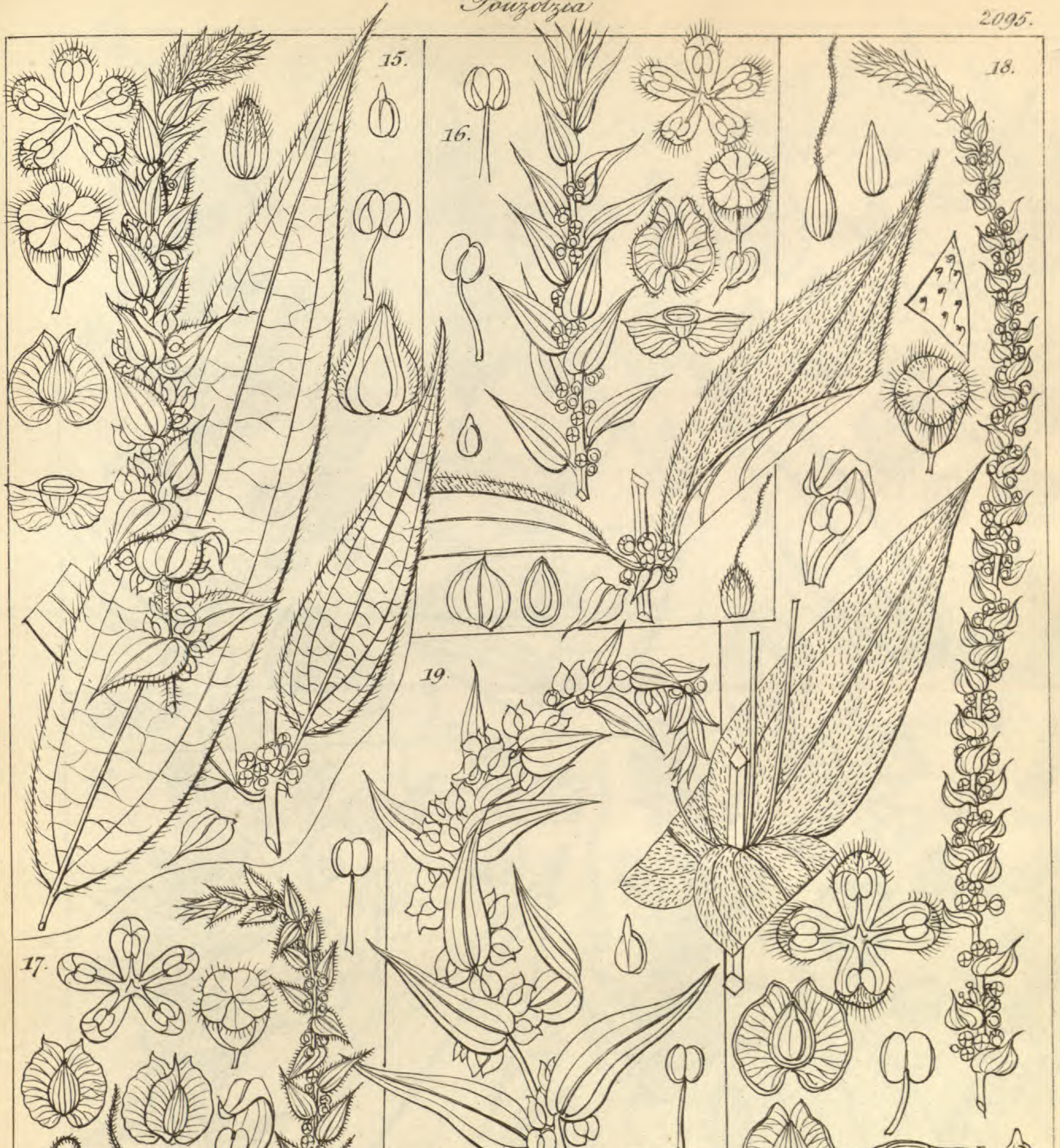
1. Parvifolia. 2. Acuta. 3. Ovalifolia. 4. Mysorensis. 5. Gardneri.



6. Longifolia. 7. Ternata. 8. Wightii. 9. Concinna. 10. Courtallensis

Govindoo del. Dumphy Lith.

11. Tomentosa - 12. Quadrialata - 13. Heterocarpa var - 14. Heterocarpa.

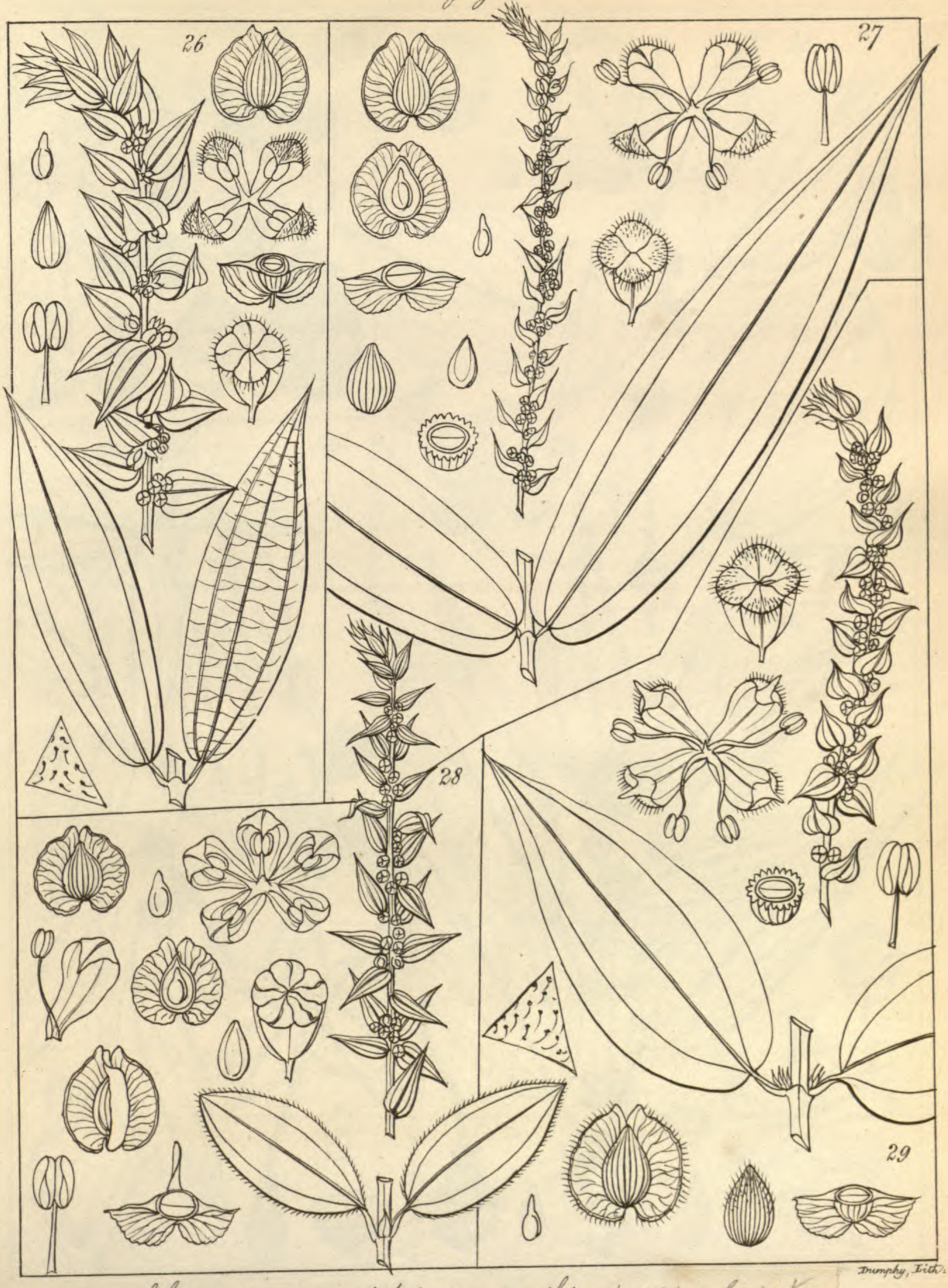


Govindoo del. Dumphy lith.

15. *Glabra* — 16. *Walkeriana* — 17. *Ramossissima* — 18. *Aspera* — 19. *Ambigua*

Dunphy, Lith.

20. pentandra _ 21. Dalzellii _ 22. trialata _ 23. Wallichiana _ 24. ovata _ 25. oblongifolia



Dumphy, Lith.

26. Neilgherrensis _ 27. caudata _ 28. ramosissima _ 29. scabra

30. microphylla – 31. rotundifolia – 32. elliptica – 33. bicuspidata.

34. rostrata _ 35. procumbens _ 36. diffusa _ 37. auriculata _ 38. Rheedii

39. angustifolia - 40. Indica - 41. scabrida 42. tetraptera - 43. minor - 44. Borbonica.

45. Zeylanica. 46. pilosa. 47. Johnsoniana. 48. pyramidata.